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OSWEGO RIVER BASIN

LOCK 24 — ERIE CANAL

ONONDAGA COUNTY, NEW YORK

INVENTORY NO. N.Y. 792

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM.

(6) Lock 24 - Erie Canal (Inventory Number NY-792), Oswego River Basin, Onondaga County, New York. Phase I Inspection Report,

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DEPARTMENT OF THE ARMY

NEW YORK DISTRICT, CORPS OF ENGINEERS

NEW YORK, NEW YORK

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization.

The examination of documents and the visual inspections of the Lock 24 dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the

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dam has some deficiencies which require further investigation and remedial action.

The spillway cannot pass the peak outflow from one-half the PMF. For this storm and lesser storm events, a high tailwater condition resulting in flooding of downstream areas would occur. Therefore, overtopping would not significantly increase the hazard to loss of life downstream from that which would exist just before such overtopping and the spillway is assessed as inadequate.

Stability analyses based on available information indicate that the stability of the dam is inadequate for all loading conditions. Additional stability analyses, taking into account measured characteristics of the dam/bedbrock interaction, should be completed within six (6) months of the date of notification of the owner. Based upon the results of these investigations, appropriate remedial measures deemed necessary to insure the safety and integrity of the dam and appurtenant structures should be undertaken and completed during the first construction season following completion of the stability analyses.

During periods of unusually heavy precipitation and high runoff occurring over the watershed, continuous surveillance should be provided both at the dam and in the downstream areas to warn of high floodwater conditions. Such surveillance procedures and other measures deemed necessary should be developed documented and placed in readiness for future use as part of a detailed emergency operation-action plan. A warning system should also be developed and implemented; to be used in the event of dam failure.

In addition, the dam has a number of problem areas which, if left uncorrected, have the potential for the development of hazardous conditions and must be corrected within one year. These areas are:

1. Determine the responsibility for the maintenance of the powerhouse, boat yard, and Mercer mill, and correct the deficiencies noted.

2. Correct concrete deterioration on the dam crest and in the general lock area.

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT

NATIONAL DAM SAFETY PROGRAM

LOCK 24 ERIE CANAL

I.D. NO. NY-792

ONONDAGA COUNTY, NEW YORK

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

NAME OF DAM:	Lock 24 Erie Canal
STATE LOCTED:	New York
COUNTY LOCATED:	Onondaga
BASIN:	Oswego River
STREAM:	Seneca River
DATES OF INSPECTION:	June 11 and June 26, 1980

ASSESSMENT

The examination of documents and the visual inspections of the Lock 24 dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which require further investigation and remedial action.

The spillway cannot pass the peak outflow from one-half the PMF. For this storm and lesser storm events, a high tailwater condition resulting in flooding of downstream areas would occur. Therefore, overtopping would not significantly increase the hazard to loss of life downstream from that which would exist just before such overtopping and the spillway is assessed as inadequate.

Stability analyses based on available information indicate that the stability of the dam is inadequate for all loading conditions. Additional stability analyses, taking into account measured characteristics of the dam/bedbrock interaction, should be completed within six (6) months of the date of notification of the owner. Based upon the results of these investigations,

appropriate remedial measures deemed necessary to insure the safety and integrity of the dam and appurtenant structures should be undertaken and completed during the first construction season following completion of the stability analyses.

During periods of unusually heavy precipitation and high runoff occurring over the watershed, continuous surveillance should be provided both at the dam and in the downstream areas to warn of high floodwater conditions. Such surveillance procedures and other measures deemed necessary should be developed, documented and placed in readiness for future use as part of a detailed emergency operation-action plan. A warning system should also be developed and implemented; to be used in the event of dam failure.

In addition, the dam has a number of problem areas which, if left uncorrected, have the potential for the development of hazardous conditions and must be corrected within one year. These areas are:

1. Determine the responsibility for the maintenance of the powerhouse, boat yard, and Mercer mill, and correct the deficiencies noted.

2. Correct concrete deterioration on the dam crest and in the general lock area.

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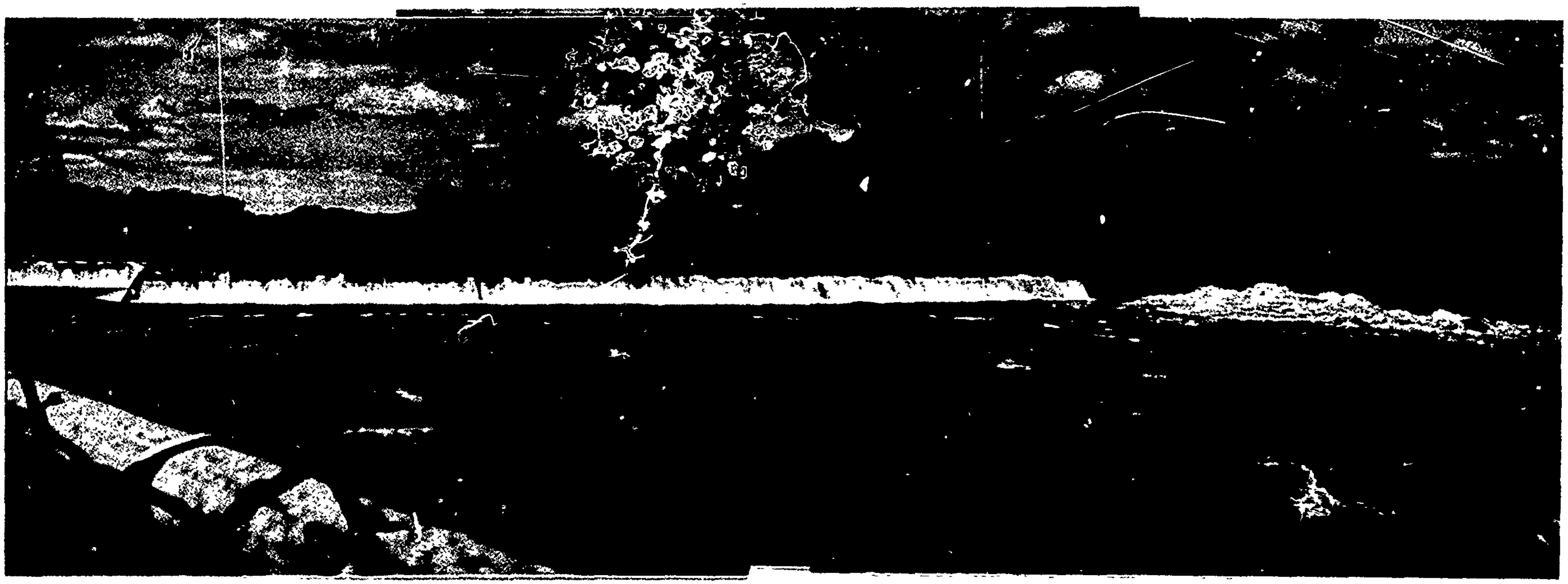


Panoramic View of
BALDWINSVILLE DAM
(Lock 24)

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

LOCK 24 ERIE CANAL

I.D. NO. NY-792

ONONDAGA COUNTY, NEW YORK

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367.

b. Purpose of Inspection

This inspection was conducted to evaluate the existing conditions of the dam, to identify deficiencies and hazardous conditions, to determine if they constitute hazards to human life and property, and to recommend remedial measures where necessary.

1.2 DESCRIPTION OF PROJECT

a. Description of the Dam and Appurtenant Structures

The Lock 24 dam is a masonry gravity overflow dam approximately 325 feet in length. It rises approximately 16 feet above its rock foundation to the fixed crest.

Flow is partially controlled by a taintor gate located at the north end (or left side) of the dam. This gate is approximately 50 feet wide.

North of the dam taintor gate, a small hydroelectric powerhouse is maintained by Niagara Mohawk Power Corporation. Flow into the powerhouse is controlled by another taintor gate approximately 50 feet in width.

The south abutment of the dam is a masonry wall of the Baldwinsville Boat Yard.

The lock which is associated with this dam is located to the south of a narrow island, approximately 200 feet south of the south dam abutment. This lock is approximately 350 feet long and 44 feet wide.

On the island are two structures which in the past have utilized the head developed by the dam for power. These are the Baldwinsville Boat Yard and the Mercer mill. These structures receive water from a forebay, or intake channel, which varies in width from approximately 120 feet to approximately 30 feet. Neither structure is utilizing the head at the present time. At the boat yard, upstream water is retained by gates with flashboards. At the time of inspection, the Mercer mill was inaccessible.

b. Location

The dam is located on the Seneca River, in the Village of Baldwinsville, New York.

c. Size Classification

The dam has a head of approximately 10 feet, and a storage volume of approximately 34,100 acre-feet. Therefore, the dam is classified as an intermediate size dam.

d. Hazard Classification

The dam is classified "high" hazard because of downstream residences and the potential impact on navigation.

e. Ownership

The Lock 24 dam is owned by the New York State Department of Transportation, Waterways Maintenance Subdivision. The controlling office is located in Syracuse, New York.

Their address is as follows:

New York State Department of Transportation
Region 3
Canal Maintenance
State Office Building
333 East Washington Street
Syracuse, New York

Mr. Leo Burns
315-473-8194

f. Purpose of the Dam

The primary purpose of the dam is to provide navigable upstream waters. The impounded waters behind the dam provide a storage pool for gravity inflow to the lock. A secondary purpose of the dam is to provide hydroelectric power.

g. Design and Construction History

The present dam is believed to have been constructed about 1893. Plans for the lock, taintor gate, and a concrete cap on the dam crest are dated 1908. Plans for a new taintor gate are dated 1963 and it is reported that this was accomplished at about this time.

h. Normal Operational Procedures

The water level behind the dam is maintained at or slightly above elevation 374.0 (BCD-Barge Canal Datum) (The dam crest elevation). Gauge readings upstream and downstream of the lock are recorded daily.

1.3 PERTINENT DATA

a. Drainage Area (square miles) 3266±

b. Elevations (Barge Canal Datum)

Top of Dam (Lock Walls)	379.0
Dam Overflow Crest	374.0
Design Pool	374.0
Maximum Recorded Pool	378.8
Taintor Gate Crest	366.0
Streambed at Dam Centerline	358±
Maximum Recorded Tailwater	372.5
Minimum Recorded Tailwater	363±

c. Storage (acre-feet)

Design Pool	34,100±

d. Dam

Type	Masonry
Length	325 feet
Height	16± feet
Top Width	5-6 feet
Foundation	Rock

e. Gate

Type	One Taintor Gate
Width	50 feet
Crest Elevation	366.0

f. Lock

Size	Approximately 350' long and 44' wide

g. Other Appurtenant Strucutures

1. Niagara Mohawk Power Corporation powerhouse with 50' wide taintor gate
2. Baldwinsville Boat Yard
3. Mercer Mill

SECTION 2: ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology

Lock 24 is located within the Village of Baldwinsville, New York in the Erie-Ontario Lowlands physiographic province.

This channel is a major glacial drainageway and, as a result, the Seneca River valley proper is filled with stratified sand and gravel outwash from the melting continental ice sheet. The surrounding terrain consists of the Iroquoian Lake plain with associated lacustrine deposits; ground moraine (glacial till) underlies these materials in most areas and forms knolls and drumlins which are free of lacustrine sediments by virtue of the fact that they were of sufficient elevation to have formed "islands" during the proglacial phase. All glacial deposits in the area reflect the most recent, or Wisconsinan, stage of the Pleistocene.

Underlying this glacial drift are Upper Silurian age mudstones of the Vernon Formation (Salina Group) and dolostones of the older Lockport Group. The Vernon is known to be gypsiferous while the Lockport Dolomite is characteristically vuggy. All rock units in the area are flat-lying over short distances, although a gentle southward dip may be discerned; all strata are non faulted and the region is considered seismically stable. However, according to Figure 1 of the Guidelines , promolgated by the Corps of Engineers, this is in an area of Zone 2 seismic probability.

b. Subsurface Investigations

No records of subsurface investigations were available. Based upon the available plans and the site characteristics, it appears that the structure is founded on rock.

2.2 DESIGN/CONSTRUCTION RECORDS

No records were available for the original masonry dam. Plans dated 1908 and identified as contract 45 show the dam, lock, taintor gate, and appurtenant structures as they presently exist. Plans for a new taintor gate are dated 1963. Selected drawings are included in Appendix E.

2.3 OPERATION RECORDS

This site has an attendant on a year-round basis. Upstream and downstream water elevation readings are recorded daily throughout the year. The dam taintor gate and the Niagara Mohawk Power Corporation taintor gate are regulated to ensure that the upstream water surface does not drop below elevation 374.0 (BCD) (the dam crest).

2.4 EVALUATION OF DATA

The data presented in this report was obtained during the site inspections and from the files of the New York State Department of Transportation. The information is considered adequate for Phase I inspection purposes.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspections of the dam and appurtenant structures were conducted on June 11, 1980 and on June 26, 1980. The weather was generally fair. The upstream water surface elevation was 374.4 (BCD) during the first inspection. For the second inspection, the upstream water surface elevation was drawn down to just below 374.0 (BCD) (the dam crest), so that the dam crest and downstream face could be inspected. This was accomplished by entering the River below the dam in a small boat. The photographs in Appendix A depict the conditions described below.

b. Dam

The original masonry portion of the dam appeared to be in satisfactory condition. Concrete deterioration was noted along the cap that comprises the dam crest.

c. Dam Taintor Gate

The dam taintor gate was operable and appeared to be in satisfactory condition.

d. Lock

The lock in general is in satisfactory condition. Some areas of concrete deterioration were noted.

e. Powerhouse and Appurtenant Structures

Concrete deterioration was noted in the general area of the powerhouse and its appurtenant structures.

f. Baldwinsville Boat Yard and Mercer Mill

Significant concrete deterioration was noted in the area of the gates at the Baldwinsville Boat Yard. Also,

flashboards appeared to be old and were observed to be leaking.

At the time of inspection, the Mercer mill was inaccessible.

g. Upstream and Downstream Channels

The conditions of the river and its banks upstream and downstream of the dam appeared to be satisfactory.

3.2 EVALUATION OF OBSERVATIONS

The following deficiencies were noted:

1. Concrete deterioration along the dam crest.
2. Concrete deterioration in the lock area.
3. Concrete deterioration in the powerhouse intake, gate area, and the tailrace.
4. Concrete deterioration in the gate area at the Baldwinsville Boat Yard.
5. Old and leaking flashboards at the Baldwinsville Boat Yard.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURE

Normal practice is to not allow the upstream water surface to drop below elevation 374.0 (BCD) (the dam crest). Flow is regulated primarily by the dam taintor gate. At very low flows, both the dam taintor gate and the Niagara Mohawk Power Corporation taintor gate must be closed.

4.2 MAINTENANCE OF DAM AND APPURTENANT STRUCTURES

The dam and appurtenant structures (lock and taintor gate) are maintained by the New York State Department of Transportation. The dam tender reported that the current maintenance is on an as-needed basis.

Increased maintenance is required to correct concrete deterioration on the dam crest and in the general lock area.

4.3 MAINTENANCE OF OTHER APPURTENANT STRUCTURES

The maintenance of the other appurtenant or adjunct structures (powerhouse, boat yard and Mercer mill) appears to rest with their respective owners. No documents were found which define this responsibility. Yet there are cases such as deteriorating concrete and leaking flashboards which, if left to continue unchecked, could lead to failure and concommittant loss of control of the pool level.

4.4 WARNING SYSTEM IN EFFECT

No apparent warning system is present.

4.5 EVALUATION

Operation and Maintenance of the dam taintor gate are satisfactory. Additional maintenance is required to correct concrete deterioration on the dam crest, in the

general lock area, in the powerhouse area, and at the Baldwinsville Boat Yard. In addition, old and leaking flashboards at the Baldwinsville Boat Yard should be replaced. Maintenance procedures at the Mercer mill should be reviewed.

A detailed emergency warning system should be developed.

SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

The Oswego River Basin in which the dam and the lock are located is in Central New York State and has a drainage area of approximately 5100 square miles at its mouth. The drainage area of the watershed at the dam is about 3266 square miles. The river system upstream of the dam includes six Finger Lakes, Cross Lake, the Barge Canal, and outlets from the lakes to the canal. The Seneca River and 16 other principal waterways drain the watershed above the dam. The Seneca River flows from Seneca Lake generally northeastward nearly 61 miles to its confluence with the Oneida River approximately 12 miles downstream of the dam. Canals within the watershed include a reach of the Erie Canal, the Seneca Canal, and the Seneca-Cayuga Canal. All of the lakes in the watershed have regulated outlets.

A major part of the Finger Lakes area is a region of rolling hills separated by deeply eroded, steep-sided valleys of moderate width. Major valleys extend generally north-south, and most are largely occupied by the Finger Lakes. This region slopes generally northward from an elevation of approximately 2000 feet near the watershed boundary to an elevation of approximately 1000 feet near the northern ends of the Finger Lakes.

5.2 ANALYSIS CRITERIA

The hydrologic analysis of this dam was performed using the Corps of Engineers HEC-1 computer program, Dam Safety Version. The spillway design flood selected for analysis was the PMF in accordance with the Recommended Guidelines of the U.S. Army Corps of Engineers.

The basic input for this study was taken from an HEC-1 model developed by the New York State Department of Environmental Conservation with assistance from the U.S. Army Corps of Engineers, Buffalo District. The model was calibrated by the D.E.C. to the observed floods of Hurricane Agnes, June 20-26, 1972. The subbasin designation, 6-hour unit hydrographs, routing methods, and loss rates for the model (those used for Hurricane Agnes) were all adopted.

The Probable Maximum Flood (PMF) was developed assuming the uniform distribution of the Probable Maximum Precipitation (PMP) over the watershed above the dam. A PMP of 21.5 inches was obtained from Hydrometeorological Report Number 51 for a 24 hour duration and a 200 square mile area.

The flood routing at the dam was performed by the modified Puls method. It was assumed that the gates in the forebay and the lock are closed during the flood.

5.3 SPILLWAY CAPACITY

The dam has a 352 feet long ungated spillway structure and a 50 feet long spillway with a taintor gate. The crest elevation of the ungated spillway is 374 and the elevation of the taintor gate sill is 366. The discharge over the dam crest was computed assuming that the discharge coefficient varies with head. The values of discharge coefficient ranged from 3.38 to 3.83. The primary spillway was analysed assuming the gate is fully opened. The discharge over the spillway was computed as weir flow for flood elevations up to 379 and as orifice flow above elevation 379. The elevation of the top of the walls on both ends of the dam is 379 and, at all stages exceeding this elevation, there will be overflow from the channel. Therefore, the discharge at both ends of the dam above elevation 379 was also computed by approximating cross sections from the plans and the U.S.G.S. quadrangle for Baldwinsville.

The spillways do not have sufficient capacity for discharging the peak outflow from either the Probable Maximum Flood (PMF) or one-half the PMF. For the PMF, the peak inflow is 111,438 cfs and the peak outflow is 109,132 cfs. For one-half the PMF, the peak inflow is 41,606 cfs and the peak outflow is 41,033 cfs. The computed spillway capacity for a water surface elevation at the top of the dam (wall at both ends) is 23,274 cfs.

5.4 RESERVOIR CAPACITY

The reservoir at normal pool impounded by this dam lies primarily within the limits of the existing channel of the Seneca River, extending approximately 10 miles, and Cross Lake. The total storage capacity of this dam up to elevation 379 is approximately 34,100 acre-feet.

5.5 FLOODS OF RECORD

The maximum known flood in the watershed occurred on June 28, 1972 as a result of Hurricane Agnes. The discharge of 17,200 cfs was recorded at the U.S.G.S. gaging station 04237500 located about 400 feet downstream of the dam. The maximum high water occurred at this same time and was recorded at the dam as 378.8, while the maximum tailwater was 372.5.

5.6 OVERTOPPING POTENTIAL

The hydrologic analysis indicates that the dam does not have sufficient spillway capacity to pass the PMF or one-half the PMF. The dam would be overtopped by 12.95 feet and 7.45 feet during the PMF and one-half PMF, respectively.

5.7 EVALUATION

The spillway will not pass the calculated peak outflow from one-half the PMF. For this storm and lesser storm events, however, a high tailwater condition resulting in flooding of downstream areas would occur. Therefore, the additional overtopping would not significantly increase the hazard to loss of life downstream from that which would exist just before such overtopping.

The spillway is assessed as inadequate.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

No visible evidence of structural instability of the dam was noted. The horizontal and vertical alignments, abutments, joints, and taintor gate all appeared to be satisfactory. The concrete deterioration noted in the visual inspection does not affect structural stability at this time.

b. Design and Construction Data

The subsurface and structural information used in the stability analyses was obtained from the contract drawings included in Appendix E. This information did not include specific properties of the supporting bedrock, precise details of dam embedment, or design details.

c. Data Review and Stability Evaluation

The stability analyses performed used the cross-section information provided on the contract drawings, plus certain simplifying assumptions regarding the dam and its foundation characteristics. The dam was considered a solid gravity section seated on, but not embedded in, bedrock.

The conditions analysed, and the resulting factors of safety, are summarized in the table which follows.

The analyses indicate less than desirable factors of safety for all loading conditions, and failure for most loading conditions. However, further inspections and analyses are required to verify or modify the assumptions made in the stability analyses. The most critical assumptions appear to be those involving the dam/bedrock interface and the actual uplift pressures.

LOCK 24 ERIE CANAL

SUMMARY OF STABILITY ANALYSES

CASE	LOADING CONDITIONS				FACTOR OF SAFETY		Resultant within Middle 1/3	Resultant within Base
	Full Uplift	1/2 Uplift	Ice	Seismic (Zone 2)	Overturning	Sliding		
a) Normal Pool		X			2.69	1.43	Yes	
	X				1.66	.90	Yes	
		X	X		1.34	.75	No	Yes
	X		X		1.02	.47	No	Yes
		X	X	X	1.29	.68	No	Yes
	X		X	X	.99	.43	No	No
b) 1/2 PMF		X			1.67	1.00	Yes	
		X		X	1.56	.83	Yes	
c) PMF		X			1.32	.61	Yes	
		X		X	1.22	.52	No	Yes

NOTE: FULL UPLIFT CONDITIONS NOT ANALYZED FOR 1/2 PMF AND PMF BECAUSE 1/2 UPLIFT CONDITIONS INDICATED FAILURE.

d. Seismic Stability

The dam is situated in seismic Zone 2. Therefore, seismic stability analyses were performed based on the Zanger hydrodynamic pressure distribution, which is similar to the Westergaard distribution recommended by the Corps of Engineers Guidelines. The analyses were performed under normal pool, one-half PMF, and full PMF. The results are tabulated in the accompanying table. Although undesirable factors f safety are indicated, further inspections and analyses are required to refine the assumptions made in the stability analyses.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase I inspection of the Lock 24 dam did not reveal conditions which constitute an immediate hazard to human life or property. However, additional maintenance is required to correct concrete deterioration on the dam crest and in the general lock area. Also, the responsibility for maintenance of the other appurtenant structures (powerhouse, boat yard, and Mercer mill) should be investigated, because failure of these structures could create problems similar to those caused by loss of the dam itself.

The spillway does not have sufficient discharge capacity for passing one-half the PMF and is considered to be inadequate. For one-half the PMF and lesser storm events, a high tailwater condition resulting in flooding of downstream areas would occur. Therefore, the additional overtopping would not significantly increase the hazard to loss of life downstream from that which would exist just before such overtopping.

The stability analyses, which were based upon assumed parameters, indicate less than adequate factors of safety for all loading conditions and actual failure under severe loadings.

During periods of unusually heavy precipitation and high runoff occurring over the watershed, continuous surveillance should be provided both at the dam and in the downstream areas to warn of high floodwater conditions. Such surveillance procedures and other measures deemed necessary should be developed, documented and placed in readiness for future use as part of a detailed emergency operation-action plan. A warning system should also be developed and implemented; to be used in the event of dam failure.

b. Adequacy of Information

The information available for the preparation of this report was adequate for the purposes of a Phase I investigation. However, additional site specific data will be required for subsequent studies.

c. Necessity for Additional Investigations

Additional investigations are necessary regarding the stability of the dam. Such investigations should be based on actual measurements of embedment, dam/bedrock friction and uplift.

d. Urgency

The stability investigations required should be completed within six (6) months of the date of notification of the owner. Based upon the results of these investigations, appropriate remedial measures deemed necessary to insure the safety and integrity of the dam and appurtenant structures should be undertaken and completed during the first construction season following completion of the stability analyses.

The urgency of other remedial measures is discussed in the following section.

7.2 RECOMMENDED MEASURES

a) The following actions should be undertaken:

1. Develop and implement a detailed emergency operation-action plan and warning system.

2. Determine the responsibility for the maintenance of the powerhouse, boat yard, and Mercer mill.

3. Correct concrete deterioration on the dam crest and in the general lock area.

4. Correct deficiencies noted for the other appurtenant structures.

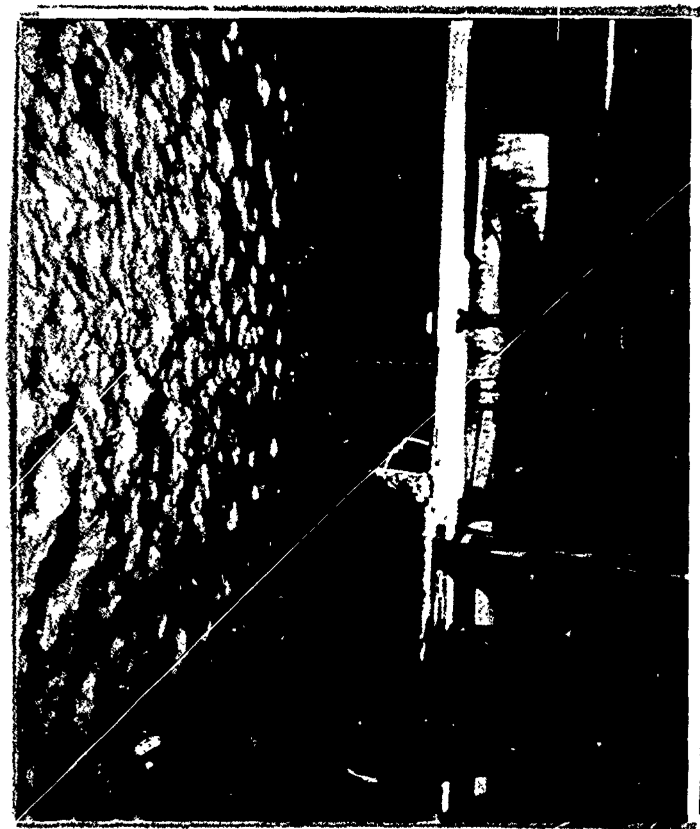
5. Take any remedial actions that may be dictated by the stability analyses.

b) The urgency of the actions listed above is as follows:

- Items 1 and 2 should be completed within 90 days after notification of the owner.
- Items 3 and 4 should be completed within 12 months after notification of the owner.
- Item 5 should be completed within the first construction season following completion of the stability analyses.

APPENDIX A

PHOTOGRAPHS



Upstream staff gauge
NOTE: Concrete deterioration

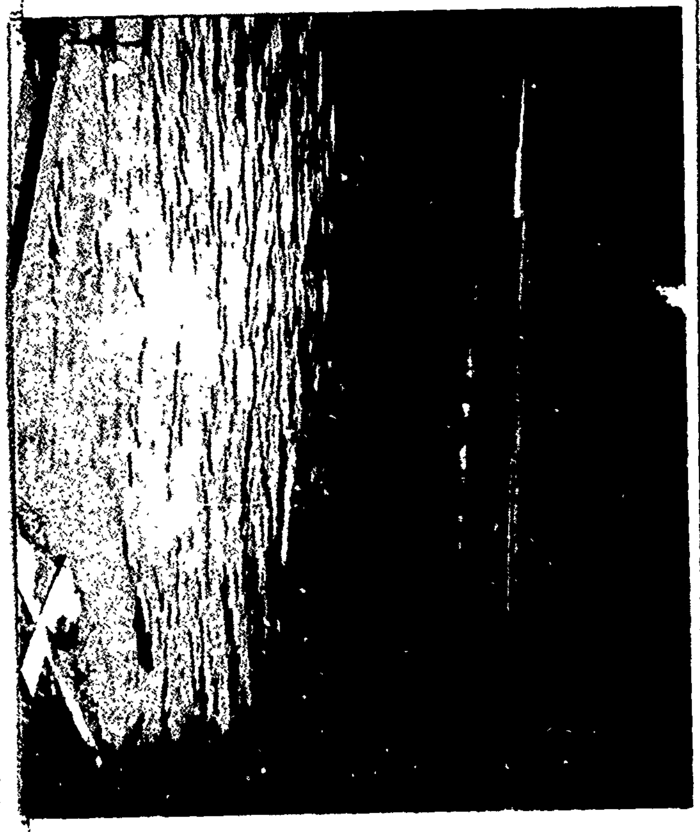
Lock 24, facing downstream

Approach to Lock 24, Facing downstream

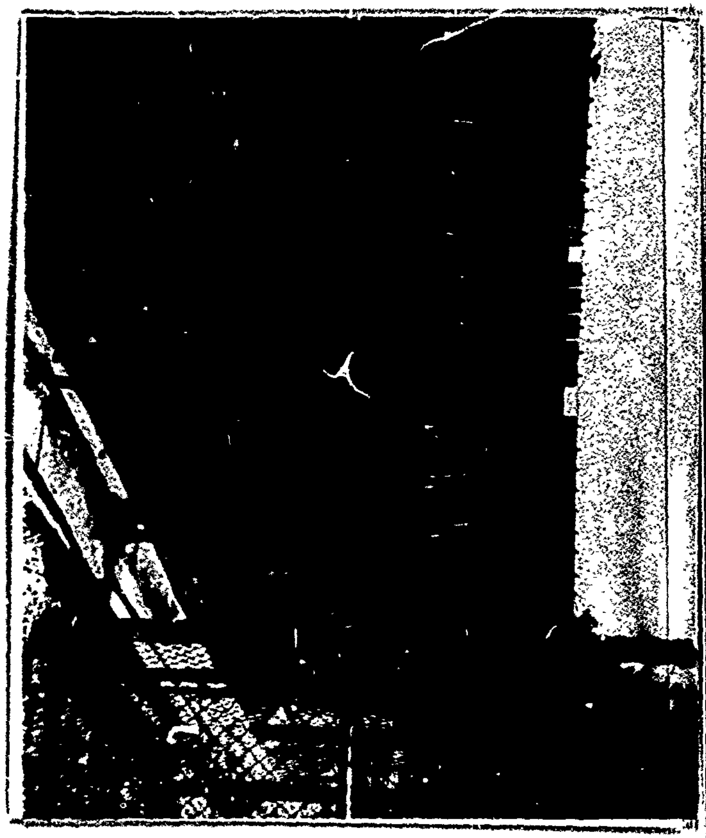
Niagara Mohawk Powerhouse intakes.

Niagara Mohawk Entrance Channel and Dam Taintor Gate

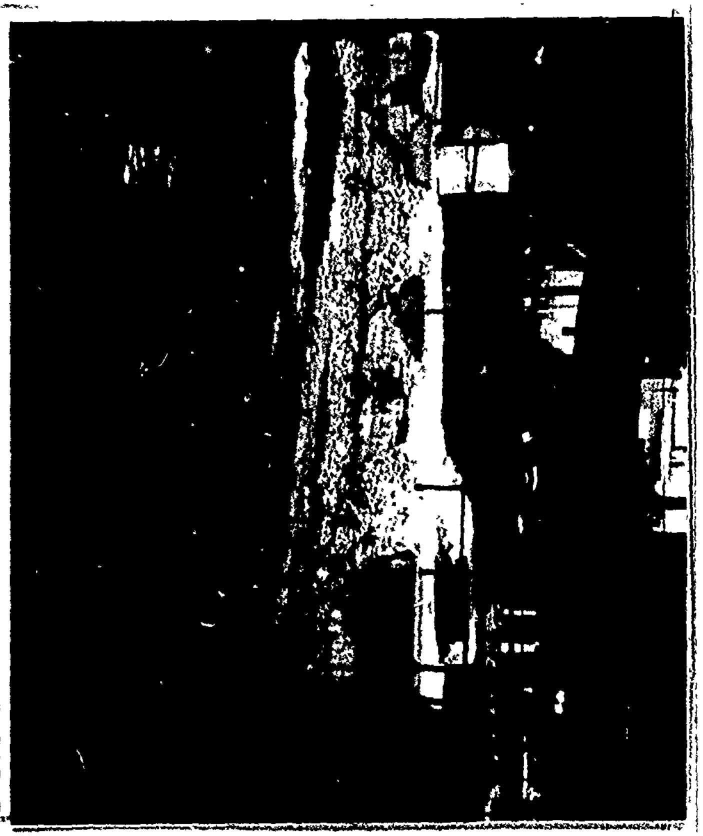
Dam Taintor Gate



Bridge between Lock approach
and Mill Intake Channel



Niagara Mohawk Taintor Gate

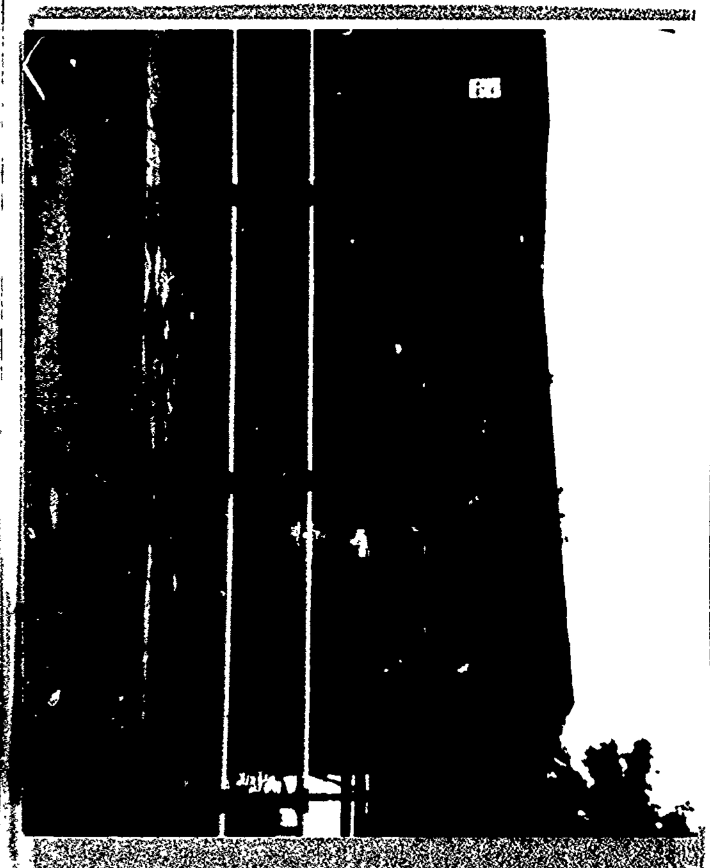


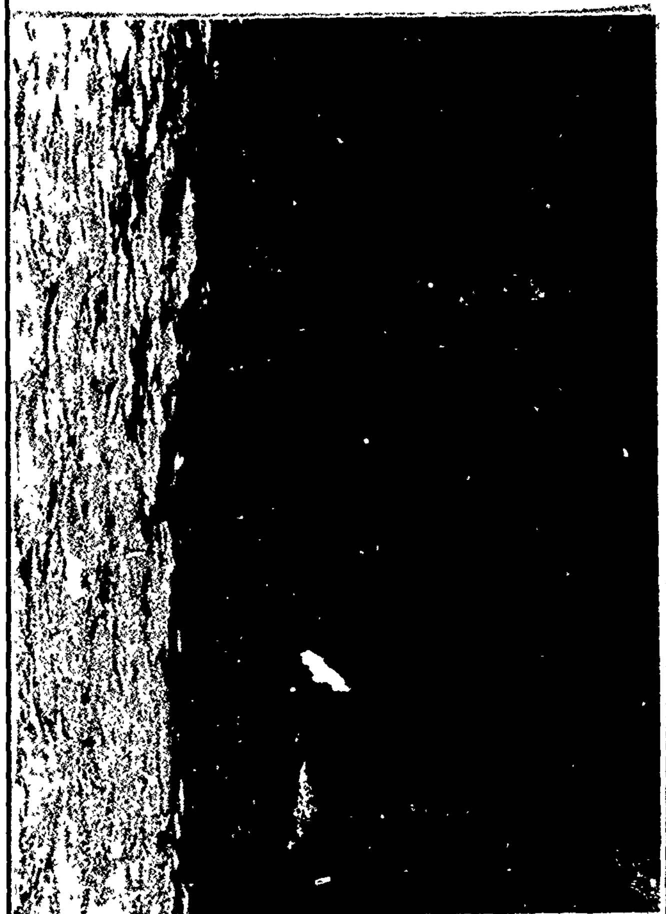
Niagara Mohawk Taintor Gate;
NOTE: Concrete deterioration

Leakage through flashboards at Baldwinsville Boat Yard

Gates at Baldwinsville Boat yard

Upstream view of Baldwinsville Boat Yard



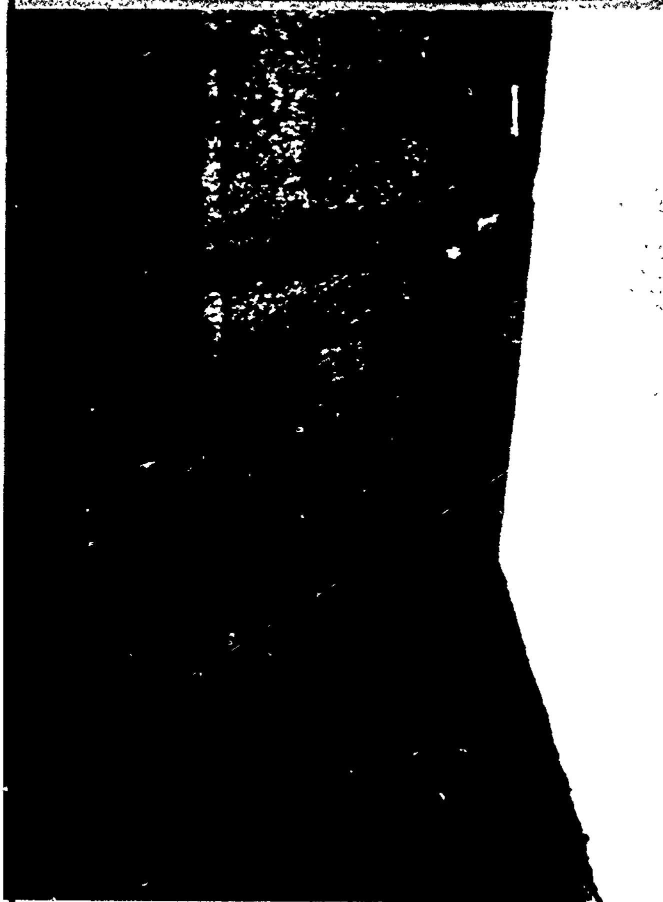


Downstream view of Mercer Mill

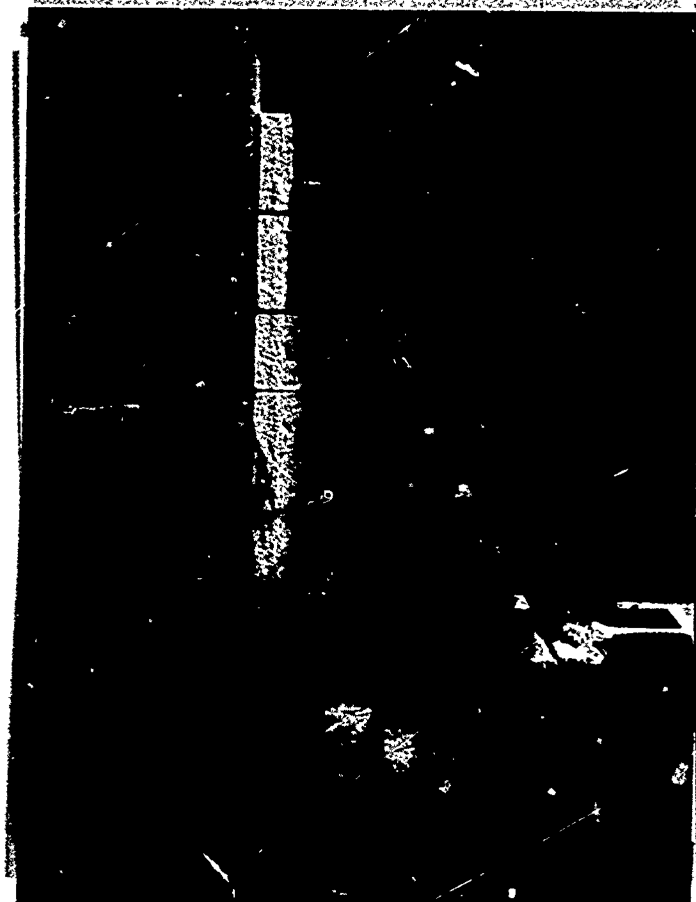
Upstream view of Mercer Mill

Co..crete deterioration at Boat Yard Gates

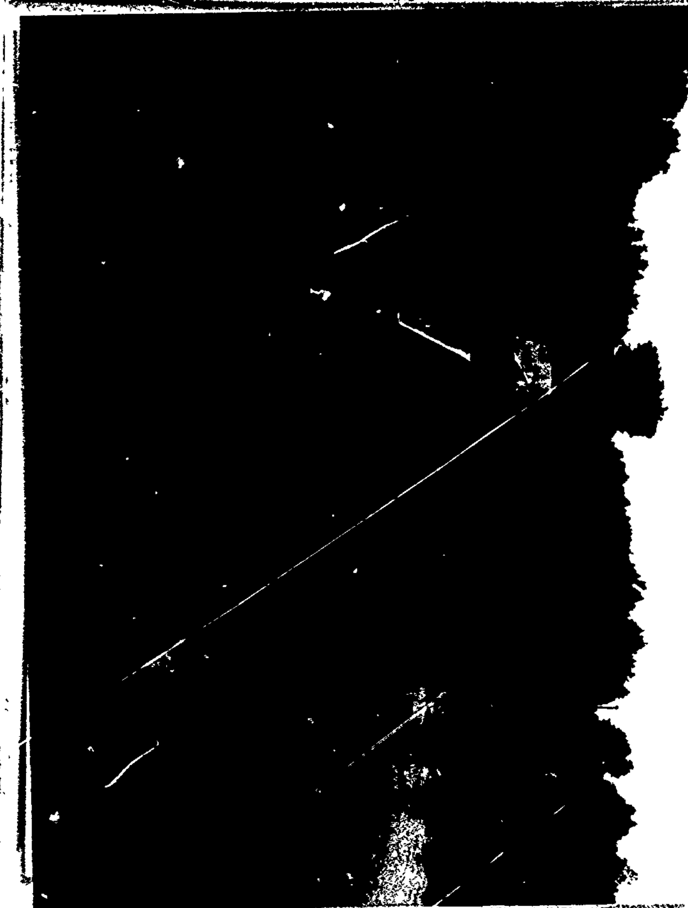
South interior corner

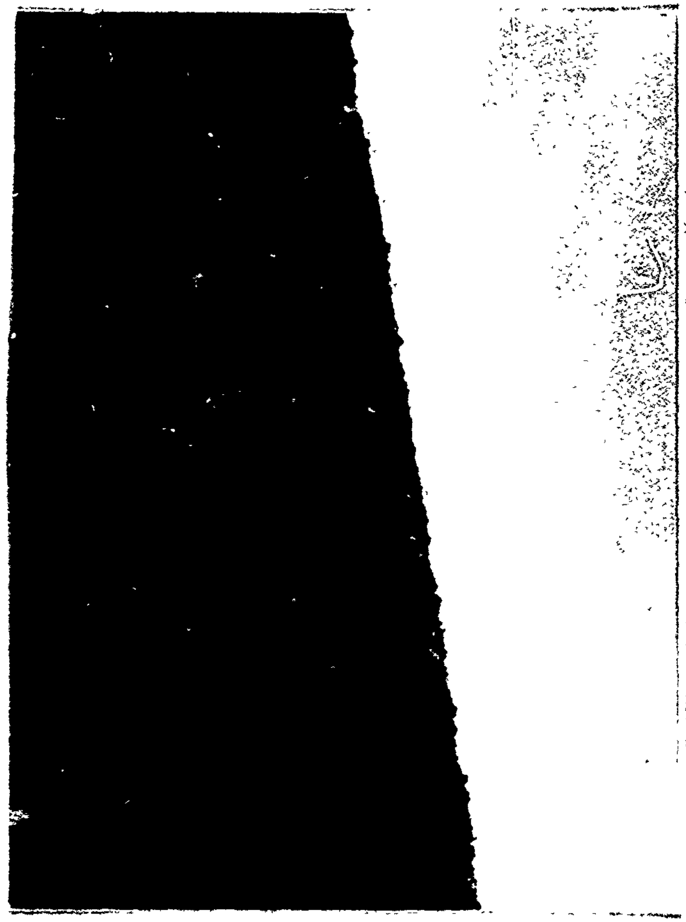


South abutment



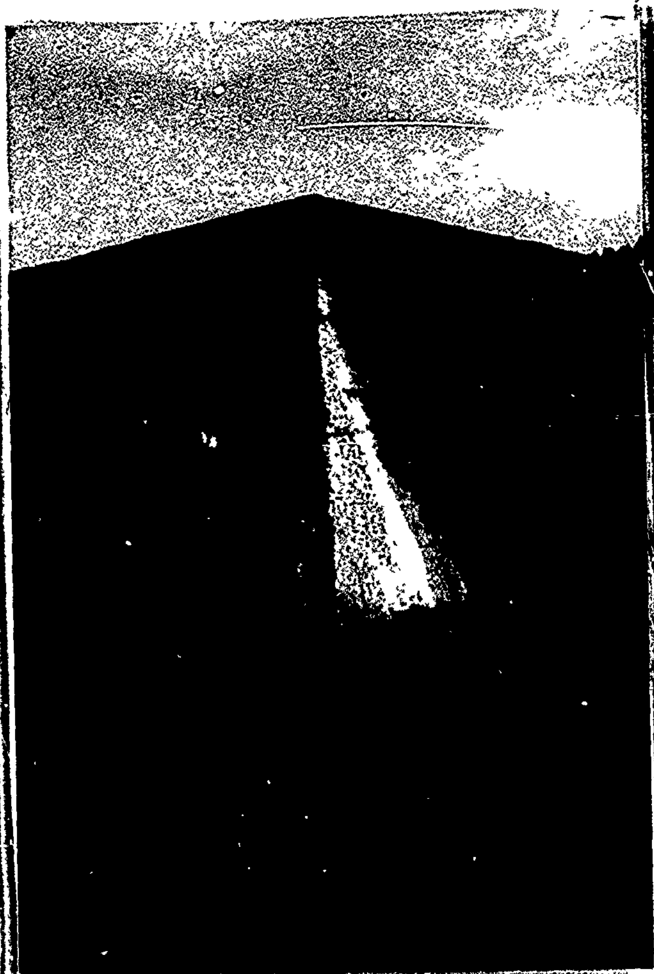
Dam, facing south

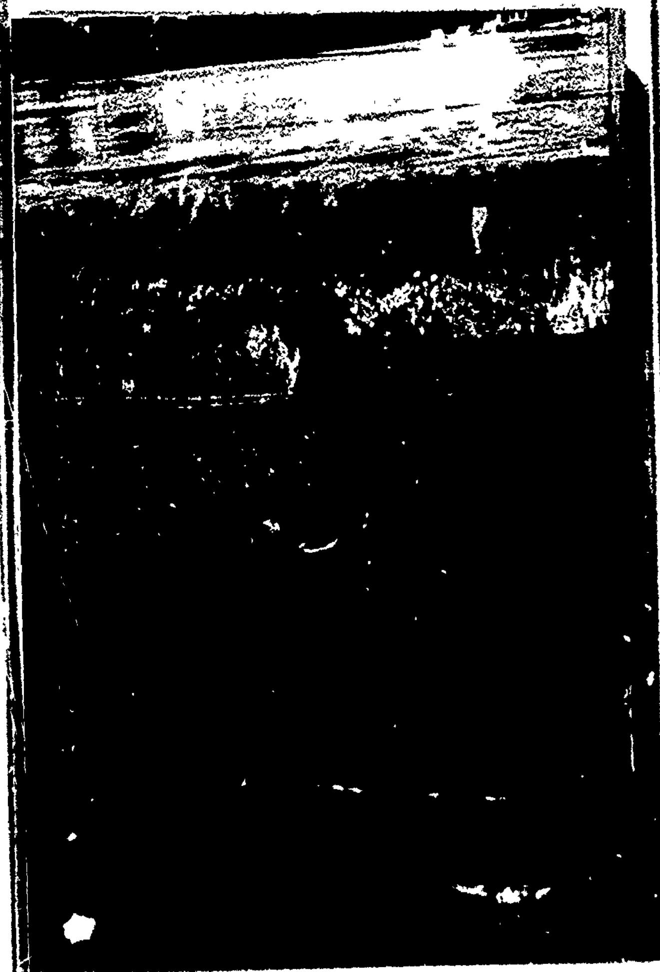




Concrete deterioration on Dam Crest

Concrete deterioration on Dam Crest





South exterior corner

Concrete deterioration on Dam Crest

APPENDIX B

VISUAL INSPECTION CHECKLIST

THOMSEN ASSOCIATES

CONSULTING GEOTECHNICAL ENGINEERS & GEOLOGISTS

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam LOCK 24 ERIE CANAL

I.D. # 72B-230 DEC. Dam No. 792

River Basin SENECA RIVER

Location: Town LYSANDER County ONONDAGA

U.S.G.S. Quadrangle BALDWINSVILLE

Stream Name SENECA RIVER

Tributary of OSWEGO RIVER

Latitude (N) 43° 9' Longitude (W) 76° 20'

Type of Dam MASONRY

Hazard Category HIGH

Date(s) of Inspection 6/11/80, 6/26/80

Weather Conditions FAIR - PARTLY CLOUDY

Reservoir Level at Time of Inspection 374.4

Tailwater Level at Time of Inspection 364.9

b. Inspection Personnel RAY TEETER (TA)

RICK WOIDT (MOT)

c. Persons Contacted (Including Address & Phone No.)

LEO BIRNS, NYSDOT (315-473-8194)

d. History:

Date Constructed APPROX. 1893 Date(s) Reconstructed 1908 (P[illegible])

NEW GATE 1963 ([illegible])

Designer UNKNOWN

Constructed by UNKNOWN

Owner PRESENTLY NYSDOT

e. Seismic Zone 2

THOMSEN ASSOCIATES
CONSULTING GEOTECHNICAL ENGINEERS & GEOLOGISTS

VISUAL INSPECTION CHECKLIST

2) Embankment

a. Characteristics

1) Embankment Material MASONRY DAM

2) Cutoff Type NONE

3) Impervious Core NONE

4) Internal Drainage System NONE

5) Miscellaneous

b. Crest

1) Vertical Alignment GOOD

2) Horizontal Alignment GOOD

3) Surface Cracks DETERIORATION OF CONCRETE

4) Miscellaneous

c. Upstream Slope

1) Slope (Estimate) (V:H) N. A.

2) Undesirable Growth or Debris, Animal Burrows N. A.

3) Sloughing, Subsidence or Depressions N. A.

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VISUAL INSPECTION CHECKLIST

4) Slope Protection N.A.

5) Surface Cracks or Movement at Toe UNOBSERVABLE

d. Downstream Slope

1) Slope (Estimate - V:H) N.A.

2) Undesirable Growth or Debris, Animal Burrows N.A.

3) Sloughing, Subsidence or Depressions N.A.

4) Surface Cracks or Movement at Toe UNOBSERVABLE

5) Seepage UNOBSERVABLE

6) External Drainage System (Ditches, Trenches; Blanket)

NONE

7) Condition Around Outlet Structure GENERALLY GOOD

8) Seepage Beyond Toe UNOBSERVABLE

e. Abutments-Embankment Contact

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VISUAL INSPECTION CHECKLIST

1) Erosion at Contact NONE NOTED

2) Seepage Along Contract NONE NOTED

3) Drainage System

a. Description of System N. A.

b. Condition of System N A.

c. Discharge from Drainage System N. A.

4) Instrumentation (Momumentation/Surveys, Observation Wells, Weirs, Piezometers, Etc.)

STAFF GAUGES — 1 UPSTREAM, 1 DOWNSTREAM

USGS MAINTAINS 2 DISCHARGE GAUGES DOWNSTREAM OF DAM

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VISUAL INSPECTION CHECKLIST

5) Reservoir

a. Slopes GENERALLY GOOD

b. Sedimentation UNDISCERNABLE

c. Unusual Conditions Which Affect Dam NONE NOTED

6) Area Downstream of Dam

a. Downstream Hazard (No. of Homes, Highways, etc.)
SEVERAL HOMES

b. Seepage, Unusual Growth NONE NOTED

c. Evidence of Movement Beyond Toe of Dam NONE NOTED

d. Condition of Downstream Channel GENERALLY GOOD

7) Spillway(s) (Including Discharge Conveyance Channel)

a. General

b. Condition of Service Spillway GENERALLY GOOD

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VISUAL INSPECTION CHECKLIST

c. Condition of Auxiliary Spillway N. A.

d. Condition of Discharge Conveyance Channel Appears Good

8) Reservoir Drain/Outlet

Type: Pipe ______ Conduit ______ Other Gate

Material: Concrete ______ Metal X Other ______

Size: Approx. 14' Length 50'

Invert Elevations: Entrance 366.0 Exit 366.0

Physical Condition (Describe): Unobservable ______

Material: Good

Joints: Good Alignment Good

Structural Integrity: Good

Hydraulic Capability: ______

Means of Control: Gate X Valve ______ Uncontrolled ______

Operation: Operable X Inoperable ______ Other ______

Present Condition (Describe): Generally Good

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9) <u>Structural</u>

a. Concrete Surfaces Some Deterioration

b. Structural Cracking None Noted

c. Movement - Horizontal & Vertical Alignment (Settlement)
None Noted

d. Junctions with Abutments or Embankments
Appear Good

e. Drains - Foundation, Joint, Face N.A.

f. Water Passages, Conduits, Sluices Appear Good

g. Seepage or Leakage N.A.

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h. Joints - Construction, etc. APPEAR GOOD

i. Foundation UNOBSERVABLE

j. Abutments GENERALLY GOOD

k. Control Gates GENERALLY GOOD

l. Approach & Outlet Channels GENERALLY GOOD

m. Energy Dissipators (Plunge Pool, etc.) N.A.

n. Intake Structures (GATES) GENERALLY GOOD

o. Stability

p. Miscellaneous

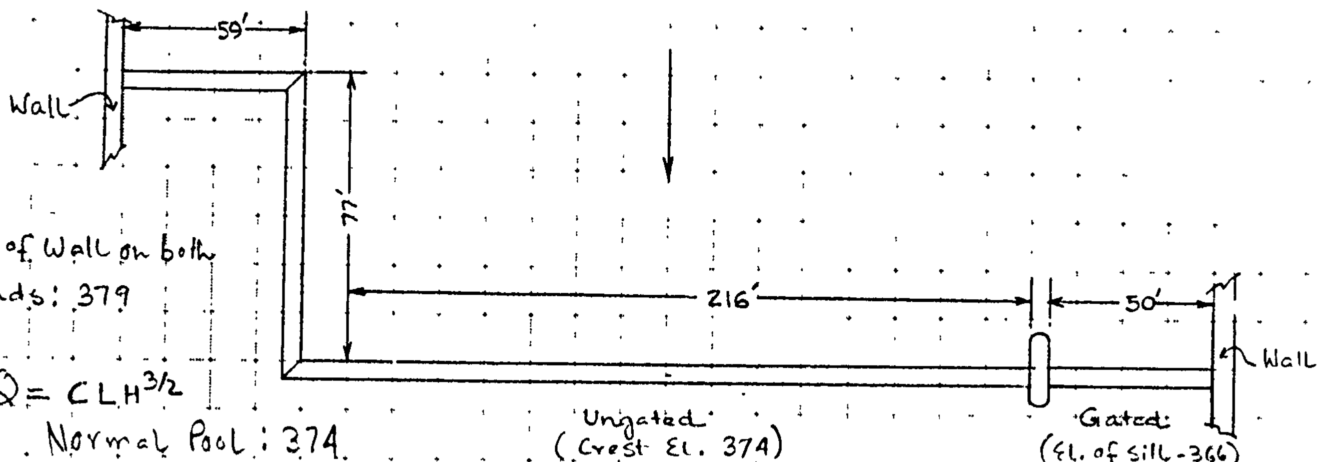
APPENDIX C

HYDROLOGIC/HYDRAULIC ENGINEERING
DATA AND COMPUTATIONS

McFarland-Johnson Engineers, Inc.
171 Front Street
BINGHAMTON, NEW YORK 13905

JOB HYDROLOGIC [illegible] DAM # NY [illegible]
SHEET NO ____ OF ____
CALCULATED BY P.S. DATE 8/19/80
CHECKED BY ____ DATE ____
SCALE ____

STAGE-DISCHARGE COMPUTATIONS (UNGATED SPILLWAY)



Top of Wall on both ends: 379

$Q = CLH^{3/2}$

Normal Pool: 374

Shape of spillway is similar to the one shown on Fig 5-17 (King & Brater)
ALL Elevations are based on Barge Canal Datum.

ElEV.	H	$H^{3/2}$	C	L	DISCHARGE
374	0			352	0
375	1	1	3.38	352	1190
376	2	2.83	3.51	352	3496
377	3	5.20	3.58	352	6553
378	4	8.0	3.68	352	10,363
379	5	11.18	3.83	352	15,072
380	6	14.7	3.83	352	19,817
382	8	22.63	3.83	352	30,509
385	11	36.48	3.83	352	49,184
387	13	46.87	3.83	352	63,18[illegible]

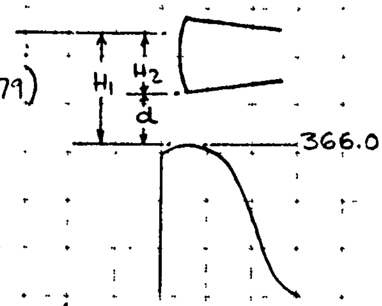
McFarland-Johnson Engineers, Inc.
171 Front Street
BINGHAMTON, NEW YORK 13905

JOB HYDROLOGIC STUDY OF DAM #NY 1[illegible]
SHEET NO ______ OF ______
CALCULATED BY P.S. DATE 8/15/80
CHECKED BY ______ DATE ______
SCALE ______

STAGE-DISCHARGE COMPUTATIONS (GATED SPILLWAY)

Assumptions:

① Gate is fully open (bottom of gate @ el. 379)
② Neglect Approach Velocity
③ Normal Pool Elev. 374.0



Elevation of top of sill - 366.0
Length of spillway - 50'
Discharge $Q = 2/3\sqrt{2g}\ C\ L\ (H_1^{3/2} - H_2^{3/2})$ (Eq. used for elev. above El. 379)
Discharge $Q = C \cdot L \cdot H^{3/2}$ (Eq. used for flood elev. below 379)

ELEV.	H_1	d	d/H_1	C	H_2	$H_1^{3/2}$	$H_2^{3/2}$	$H_1^{3/2} - H_2^{3/2}$	Discharge
374	8	13	1.62	3.50	0	22.63			3960
375	9	13	1.44	3.50	0	27.0			4725
376	10	13	1.30	3.50	0	31.62			5533
377	11	13	1.18	3.50	0	36.48			6384
378	12	13	1.08	3.50	0	41.57			7275
379	13	13	1.0	3.50	0	46.87			8202
380	14	13	.93	.64	1	52.38	1	51.38	8796
382	16	13	.81	.64	3	64.0	5.20	58.80	10,066
385	19	13	.68	.647	6	82.82	14.70	68.12	11,790
387	21	13	.62	.655	8	96.23	22.63	73.60	12,895

NOTE: BUREC. PUBLICATION "DESIGN OF SMALL DAMS - FIG. 257" WAS USED TO COMPUTE COEFFICIENT OF DISCHARGE 'C' FOR ORIFICE FLOW.

McFarland-Johnson Engineers, Inc.
171 Front Street
BINGHAMTON, NEW YORK 13905

JOB HYDROLOGIC STUDY DAM # NY 77.

SHEET NO ________ OF ________

CALCULATED BY P.S. DATE 8/20/80

CHECKED BY ________ DATE ________

SCALE ________

STAGE-DISCHARGE COMPUTATIONS IN OVERBANKS

ELEV.	1.486/n	A	P	R	$R^{2/3}$	Q	REMARKS
			SUBAREA-1				
380	42.45	17.5	35	.5	.63	10.5	S=.0005 For
382	42.45	197.5	145	1.36	1.23	230	all subareas.
385	42.45	842.5	290	2.90	2.04	1631	n=.035
387	42.45	1532	395	3.88	2.47	3590	
			SUBAREA-2				
380	99	100	100	1	1	221	
382	99	300	100	3	2.08	1381	n=.015
385	99	600	100	6	3.30	4383	
387	99	800	100	8	4	7084	
			SUBAREA-5				
380	99	50	50	1	1	110	
382	99	150	50	3	2.08	690	n=.015
385	99	300	50	6	3.30	2191	
387	99	400	50	8	4.0	3542	
			SUBAREA-6				
380	148.6	90	90	1	1	299	
382	148.6	270	90	3	2.08	1866	n=.01
385	148.6	540	90	6	3.30	5921	
387	148.6	720	90	8	4.0	9569	
			SUBAREA-7				
380	49.5	140	280	.5	.63	98	
382	49.5	700	280	2.5	1.84	1425	n=.03
385	49.5	1540	280	5.5	3.11	5301	
387	49.5	2100	280	7.5	3.83	8905	
			SUBAREA-8				
380							
382	29.7	60	60	1	1	40	n=.05
385	29.7	375	150	2.5	1.84	458	
387	29.7	735	210	3.5	2.30	1125	

NOTE: SEE ATTACHED CROSS SECTION

McFarland-Johnson Engineers, Inc.
171 Front Street
BINGHAMTON, NEW YORK 13905

JOB HYDROLOGIC STUDY DAM # NY792
SHEET NO ______ OF ______
CALCULATED BY F.S. DATE 8/20/80
CHECKED BY ______ DATE ______
SCALE ______

STAGE-DISCHARGE TABULATION

ELEV. (FEET)	PRIMARY SPILLWAY Q (C.F.S.)	AUXILLIARY SPILLWAY Q (C.F.S.)	SUBAREA DISCHARGE IN C.F.S.						TOTAL DISCHARGE (C.F.S.)	REMARKS
			1	2	5	6	7	8		
374	3960	0							3,960	Normal Pool Elev. -374.0 (Barge Canal Datum)
375	4725	1190							5,915	
376	5533	3496							9,029	
377	6384	6553							12,937	U.S.G.S. = B.C.D-1.04
378	7275	10,363							17,638	
379	8202	15,072							23,274	
380	8796	19,817	10	221	110	299	98	0	29,351	
382	10,066	30,509	230	1381	690	1866	1425	40	46,207	
385	11,790	49,184	1631	4383	2191	5921	5301	458	80,859	
387	12,895	63,188	3590	7084	3542	9569	8905	1125	109,898	

Note: Stage-Discharge Curve was plotted to interpolate other values for HEC-1 input. Curve is attached.

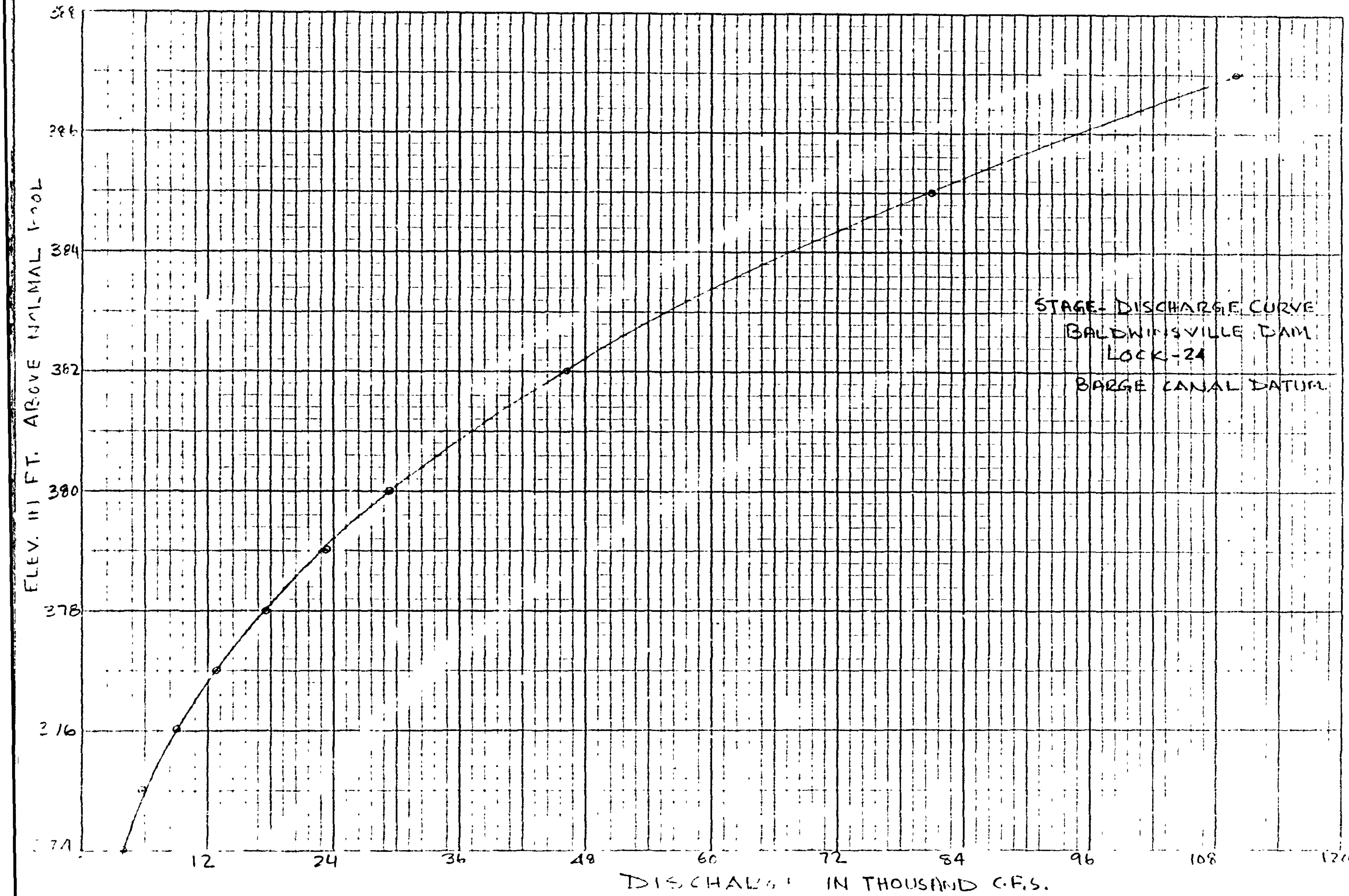
McFarland-Johnson Engineers, Inc.
171 Front Street
BINGHAMTON, NEW YORK 13905

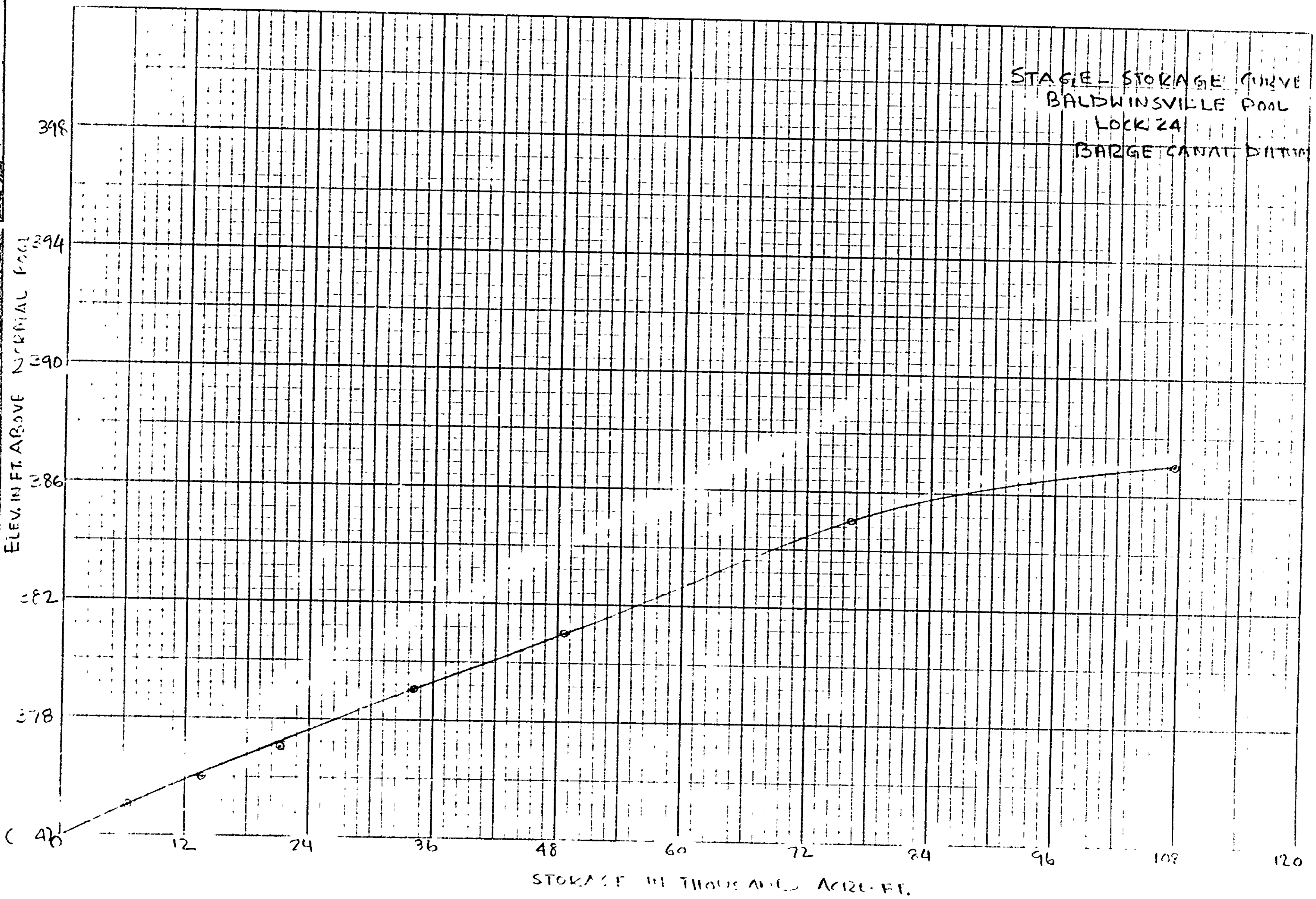
JOB HYDROLOGIC STUDY DAM # NY 792
SHEET NO ______ OF ______
CALCULATED BY P. S. DATE 8/21/80
CHECKED BY ______ DATE ______
SCALE ______

STAGE - STORAGE TABULATION

U.S.G.S. DATUM		B.C.D.	CROSS LAKE STORAGE IN ACRE-FT.	TOTAL STORAGE (ACRE-FT.)	REMARKS
CROSS LAKE ELEV.	ELEV. AT DAM	ELEV. AT DAM			
373	373	374	0	0	
375	374	375	5000	6500	Stage-Storage data upto elevation 379 was obtained from N.Y. State D.E.C.
377	375	376	10,500	13,650	Storage above elev. 379 was computed by estimating surface area adjacent to Cross Lake from U.S.G.S. quadrangles for Jordan, Lysander and Cato.
379	376	377	16,400	21,320	
380	376.5	377.5	19,400	25,220	
382	378	379	26,200	34,100	
385	380	381	37,500	48,750	
390	384	385	58,750	76,375	Total Pool storage is estimated as 130% of Cross Lake storage in accordance with D.E.C.
395	386	387	82,690	107,500	

Note: Stage-storage curve was plotted to interpolate other values for HEC-1 input. Curve is attached.


STAGE- DISCHARGE CURVE
BALDWINSVILLE DAM
LOCK-24
BARGE CANAL DATUM
ELEV. IN FT. ABOVE NORMAL POOL
386
384
382
380
378
376
12
24
36
48
60
72
84
96
108
DISCHARGE IN THOUSAND C.F.S.



KEUFFEL & ESSER CO. MADE IN U.S.A.
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Table A-2

Flood Model Drainage Areas

Area Code	Area Description	Drainage Area (sq.mi.)
A1	Canandaigua Lake	184
A2	Flint Creek at Mouth	102
A3	Canandaigua Outlet @ B.C. Confluence	155
B1	Keuka Lake	183
B2	Seneca Lake	524
B3	Cayuga Lake	782
B4	Seneca Lake Outlet to Lock 4	39
B5	Seneca Lake Outlet from Lock 4 to Mud Lock	36
C1	Owasco Lake	201
C2	Skaneateles Lake	74
C3	Otisco Lake	42.7
C4	Onondaga Reservoir	67.7
C5	Onondaga Lake	102.3
C6	Owasco Outlet @ B.C. Confluence	18.7
C7	Skaneateles Creek @ B.C. Confluence	27
C8	Ninemile Creek @ Mouth	72.3
D1	Chittenango Creek @ Mouth	288
D2	Canaseraga Creek @ Mouth	105
D3	Oneida Creek @ Mouth	144
D4	Fish Creek and Wood Creek	529
D5	Local Inflow to Oneida Lake	269
D6	Local Inflow to Oneida River above Lock 23	28.5
D7	Oneida River from Lock 25 to Three Rivers	110
E1	Ganargua Creek @ Lock 29	147
E2	Ganargua Creek @ Lock 27	118
E3	Local Inflow to B.C. Lock 29 to Lock 27	51
E4	Local Inflow to B.C. Lock 27 to Lock 26	89
E5	Local Inflow to B.C. Lock 26 to Lock 25	18
E6	Local Inflow to B.C. Lock 25 to Owasco Outlet	191
E7	Local Inflow to B.C. Owasco to Skaneateles Outlet	98
E8	Local Inflow to B.C. Skaneateles to Lock 24	98
E9	Local Inflow to B.C. Lock 24 to Three Rivers	37

Table A-6

Modelling Parameters

Subbasin	QRSCN*	RTIOR Ratio**	Start Q CFS	Losses Initial	Losses Constant in 1 hr.
A-1 - Canandaigua Lake	1000	1.6	300	1.25	0.03
A-2 - Flint Creek	2000	1.6	90	0.50	0.06
A-3 - Canandaigua Outlet	200	1.6	150	0.60	0.06
B-1 - Keuka Lake	800	1.6	100	1.50	0.03
B-2 - Seneca Lake	2800	1.6	500	1.50	0.03
B-3 - Cayuga Lake	1700	1.6	1000	0.5	0.03
B-4 - Seneca Lake Outlet to Lock CS-4	200	1.6	92	0.50	0.05
B-5 - Seneca Lake Outlet to CS-4 to CS-1	200	1.6	92	0.50	0.05
C-1 - Owasco Lake	1000	1.6	450	0.75	0.05
C-2 - Skaneateles Lake	500	1.6	250	0.75	0.05
C-3 - Otisco Lake	300	1.6	90	0.75	0.05
C-4 - Onondaga Reservoir	302	1.6	250	1.5	0.06
C-5 - Onondaga Lake	500	1.6	250	1.25	0.06
C-6 - Owasco Lake Outlet	200	1.6	90	0.50	0.06
C-7 - Skaneateles Creek	200	1.6	90	0.50	0.06
C-8 - Ninemile Creek	300	1.6	250	1.00	0.06
D-1 - Chittenango Creek	2160	1.6	600	0.25	0.06
D-2 - Canaseraga Creek	800	1.6	240	0.25	0.06
D-3 - Oneida Creek	1080	2.00	320	0.25	0.06
D-4 - Fish Creek	3960	1.6	800	0.25	0.06
D-5 - Area Local to Oneida Lake	2000	1.6	540	0.25	0.05
D-6 - Oneida River above Lock E-23	210	1.6	70	0.5	0.06
D-7 - Oneida River Lock E-23 to Three Rivers	800	2.00	250	0.5	0.06
E-1 - Ganargua Creek Vic. Lock E-29	550	1.6	140	0.5	0.05
E-2 - Ganargua Creek Lock E-27	470	1.6	120	0.5	0.05
E-3 - Area Local to Barge Canal Lock E-29 to E-27	200	1.6	100	0.5	0.05
E-4 - Area Local to Barge Canal E-27 to E-26	360	1.6	100	0.5	0.06
E-5 - Area Local to Barge Canal E-26 to E-28	100	1.6	90	0.5	0.06
E-6 - Area Local to Barge Canal E-28 to Owasco Outlet	400	1.6	140	0.5	0.06
E-7 - Area Local to Barge Canal Owasco Outlet to Skan.Outlet	400	1.6	120	0.5	0.06
E-8 - Area Local to Barge Canal, Skan. Outlet to Lock E-24	400	1.6	120	0.5	0.06
E-9 - Area Local to Barge Canal Lock E-24 to Three Rivers	150	1.6	100	0.5	0.06

*Flow in cfs below which base flow recession occurs.
**Ratio of recession flow to that flow occurring 10 time intervals later.

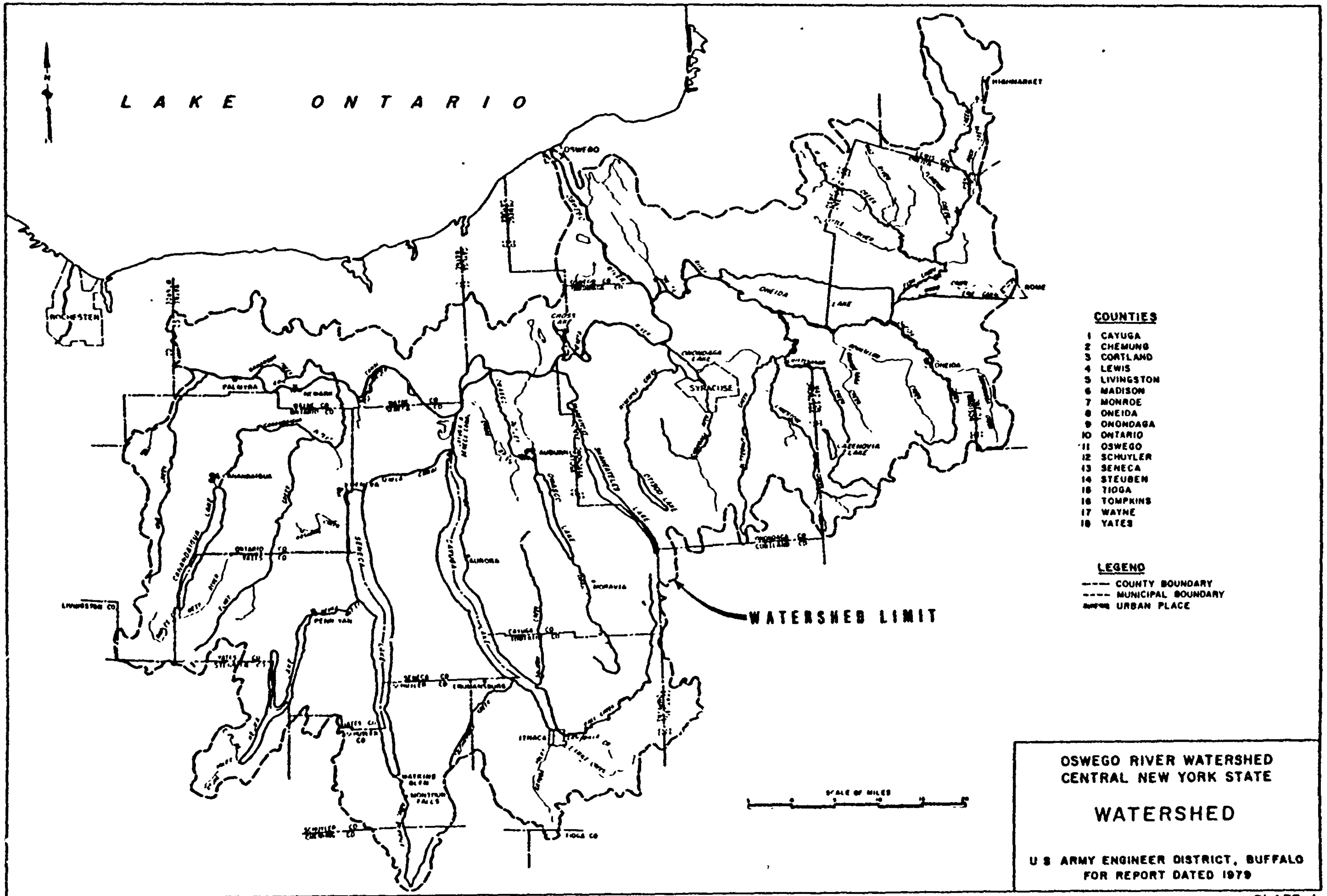
LAKE ONTARIO
OSWEGO
ROCHESTER
HIGHMARKET
ROME
ONEIDA LAKE
ONEIDA
SYRACUSE
ONONDAGA LAKE
CROSS LAKE
AUBURN
PALMYRA
NEWARK
CANANDAIGUA LAKE
SENECA LAKE
CAYUGA LAKE
OWASCO LAKE
SKANEATELES LAKE
OTISCO LAKE
CAZENOVIA LAKE
AURORA
MORAVIA
PENN YAN
ITHACA
WATKINS GLEN
MONTOUR FALLS
LIVINGSTON CO
TIOGA CO
WATERSHED LIMIT
SCALE OF MILES
COUNTIES
1 CAYUGA
2 CHEMUNG
3 CORTLAND
4 LEWIS
5 LIVINGSTON
6 MADISON
7 MONROE
8 ONEIDA
9 ONONDAGA
10 ONTARIO
11 OSWEGO
12 SCHUYLER
13 SENECA
14 STEUBEN
15 TIOGA
16 TOMPKINS
17 WAYNE
18 YATES
LEGEND
COUNTY BOUNDARY
MUNICIPAL BOUNDARY
URBAN PLACE
OSWEGO RIVER WATERSHED
CENTRAL NEW YORK STATE
WATERSHED
U S ARMY ENGINEER DISTRICT, BUFFALO
FOR REPORT DATED 1979

PLATE 1

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A             ANALYSIS OF DAM OVERTOPPING USING RATIOS OF PMF
A          HYDROLOGIC-HYDRAULIC ANALYSIS OF SAFETY OF LOCK 24 DAM
A                RATIOS OF PMF ROUTED THROUGH THE RESERVOIR
B       40       6       0       0       0       0       0       0       4
B1       5
J        1       6       1
J1      .2      .4      .5      .6      .8     1.0
K        0       1       0       0       0       0       1
K1       1 BARGE CANAL LOCK 30 AT MACEDON (SUB AREA G1)
M       -1       0     100       0    3236       0       0       0       1
N      372     372     372     372     374     378     379     379     386     392
N      390     380     375     372     113      23      25      21      21      22
N       22      21      22      22      21      21      22      22      22       0
N
K        1       2       0       0      .0       0       1
K1       2 BARGE CANAL LOCK 29 PALMYRA (ROUTED FLOW FROM LOCK 30)
Y        0       0       0      .0       1
Y1       0       3       1
K        0       2       0       0       0       0       1
K1       3 GANARGUA CREEK LOCAL INFLOWS TO LOCK 29 (SUB-AREA E-1)
M        1      -1     147       0    3236       0       0       0       1
P        0    21.5      39      53      61      72
T        0       0       0       0       0       0     0.5    0.05
U       21
U1     514    1946    2958    2655    1978    1472    1095     815     515     389
U1     306     250     186     138     103      76      57      42      25      25
U1      21
X      140     550     1.6
K        2       2       0       0       0       0       1
K1       4 COMBINED ROUTED AND LOCAL FLOWS AT LOCK 29
K        1       6       0       0       0       0       1
K1       5 ROUTED HYDROGRAPH TO LOCK 27 AT LYONS
Y        0       0       0       0       1
Y1       0       8       3
K        0       6       0       0       0       0       1
K1       6 LOWER GANARAGUA LOCAL INFLOWS VICINITY OF LOCK 27 (SUB-AREA E-2)
M        1      -1     118       0    3236       0       0       0       1
P        0    21.5      39      53      61      72
T        0       0       0       0       0       0     0.5    0.05
U       27
U1      28     109     293     523     696     773     896     980    1246    1312
U1    1218     979     764     596     465     363     283     221     173     135
U1     105      82      64      50      39      35      35
X      120     470     1.6
K        2       6       0       0       0       0       1
K1       7 COMBINED AND LOCAL FLOWS AT LOCK 27
K        0       3       0       0       0       0       1
K1       8 LOCAL FLOW E-3 (AREA LOCAL TO BARGE CANAL E-29 TO E-27)
M        1      -1      51       0    3236       0       0       0       1
P        0    21.5      39      53      61      72
T        0       0       0       0       0       0     0.5    0.05
U       10
U1    2081    1638     844     383     174      79      36      30      25      16
X      100     200     1.6
K        1       6       0       0       0       0       1
K1       9 ROUTED FLOW E-3 TO LYONS (NODE 6)
Y        0       0       0       0       1
Y1       0       5       2
K        2       6       0       0       0       0       1
K1      10 COMBINE FLOWS AT NODE 6
K        0       4       0       0       0       0       1
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6200   K1       11 CANANDAIGUA LAKE INFLOW (SUBAREA A1)
6300   M      1     -1    184      0   3236      0      0      0      1
6400   P      0   21.5     39     53     61     72
6500   T      0      0      0      0      0      0   1.25   0.03
6600   U      6
6700   U1  8556   5183   3260   1507    691    316    145     30
6800   X    300   1000    1.6
6900   K      1      4      0      0      0      0      1
7000   K1       12 CANANDAIGUA LAKE OUT FLOW USING MODIFIED PULS METHOD
7100   Y      0      0      0      1      1
7200   Y1     1      0      0      0      0      0  51000
7300   Y2 10700  21300  31900  42500  53100  63700  74300  84900  95500 106100
7400   Y2212500 319000
7500   Y3    50     50     50     50    280    600   1000   1560   2250   3000
7600   Y3 63000 200366
7700   K      1      5      0      0      0      0      1
7800   K1       13 ROUTED OUTFLOW TO FLINT CREEK MOUTH
7900   Y      0      0      0      0      1
8000   Y1     0     12      5
8100   K      0      5      0      0      0      0      1
8200   K1       14 FLINT CREEK INFLOW A-2
8300   M      1     -1    102      0   3236      0      0      0      1
8400   P      0   21.5     39     53     61     72
8500   T      0      0      0      0      0      0    0.5   0.06
8600   U     26
8700   U1    93    534    903   1266   1367   1166    966    801    66.    549
8800   U1   455    377    311    259    215    178    147    104    101     84
8900   U1    69     57     47     39     35     32
9000   X     90   2000    1.6
9100   K      2      5      0      0      0      0      1
9200   K1       15 COMBINE ROUTED CANANDAIGUA OUTFLOWS AND FLINT CK INFLOWS
9300   K      1     56      0      0      0      0      1
9400   K1       16 ROUTED TO LOCK 27
9500   Y      0      0      0      0      1
9600   Y1     0      7      3
9700   K      0     56      0             0      0      1
9800   K1       17 OUTLET LOCAL FLOW A-3
9900   M      1     -1    155      0   3236      0      0      0      1
10000  P      0   21.5     39     53     61     72
10100  T      0      0      0      0      0      0    0.6   0.06
10200  U     22
10300  U1    91    338    905   1348   1716   2408   2601   1921   1413   1038
10400  U1   763    562    412    303    223    164    120     90     65     48
10500  U1    35     34
10600  X    150    200    1.6
10700  K      2     56      0      0      0      0      1
10800  K1       18 COMBINE LOCAL FLOW A-3 WITH FLOW AT LOCK 27
10900  K      1      6      0      0      0      0      1
11000  K1       19 ROUTE OUTLET TO CANAL
11100  Y      0      0      0      0      1
11200  Y1     0      1
11300  K      2 [illegible] 0   0      0      0      1
11400  K1       20 COMBINE FLOW AT 6(OUTLET FLOW + E-1, E-2, E-3)
11500  K      1      8      0      0      0      0      1
11600  K1       21 ROUTE FLOWS AT LOCK 27 TO NODE 8
11700  Y      0      0      0      0      1
11800  Y1     0      8      3
11900  K      0      7      0      0      0      0      1
12000  K1       22 LOCAL INFLOW LOCK 27 TO LOCK 26 (E4)
12100  M      1     -1     69      0   3236      0      0      0      1
12200  P      0   21.5     39     53     61     72
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12300   T      0        0        0        0        0        0      0.5     0.06
12400   U     23
12500   U1   897     1678     1441     1144      906      721      572      454      361      287
12600   U1   227      181      143      114       90       72       57       45       36       29
12700   U1    23       23       23
12800   X    100      360      1.6
12900   K      1        8        0        0        0        0        1
13000   K1        23 ROUTE FLOWS AT LOCK 26 TO NODE 8
13100   Y      0        0        0        0        1
13200   Y1     0        2
13300   K      2        8        0        0        0        0        1
13400   K1        24 COMBINE ROUTED AND LOCAL FLOWS AT NODE 8
13500   K      1       10        0        0        0        0        1
13600   K1        25 ROUTE FLOWS AT NODE 8 TO NODE 10
13700   Y      0        0        0        0        1
13800   Y1     0        5        2
13900   K      0        9        0        0        0        0        1
14000   K1        26 LOCAL FLOW BETWEEN LOCK 26 AND LOCK 25 (E-5)
14100   M      1       -1       18        0     3236        0        0        0        1
14200   P      0     21.5       39       53       61       72
14300   T      0        0        0        0        0        0      0.5     0.06
14400   U     21
14500   U1   171      304      313      246      193      152      119       93       73       58
14600   U1    45       35       28       22       17       13       11        8        6        5
14700   U1     4
14800   X     90       90      1.6
14900   K      1       10        0        0        0        0        1
15000   K1        27 ROUTE INFLOW E-5 TO NODE 10
15100   Y      0        0        0        0        1
15200   Y1     0        2
15300   K      2       10        0        0        0        0        1
15400   K1        28 COMBINE ROUTED FLOW WITH FLOW AT NODE 10
15500   K      1       15        0        0        0        0        1
15600   K1        29 ROUTE FLOWS AT NODE 10 TO NODE 15
15700   Y      0        0        0        0        1
15800   Y1     0        5        2
15900   K      0       11        0        0        0        0        1
16000   K1        30 LOCAL INFLOW B-1 INTO KEUKA LAKE
16100   M      1       -1      183        0     3236        0        0        0        1
16200   P      0     21.5       39       53       61       72
16300   T      0        0        0        0        0        0     1.50     0.03
16400   U      6
16500   U1 14318     3342     1273      483      183        0
16600   X    100      800      1.6
16700   K      1       11        0        0        0        0        1
16800   K1        31 KEUKA LAKE OUTFLOW W/ MODIFIED PULS
16900   Y      0        0        0        1        1
17000   Y1     1        0        0        0        0        0   147000
17100   Y2107000   129500   141000   153500   172000   178000   191000   204000   217000   328550
17200   Y3   120      320      445      530      575      670      890     1130     1470   126000
17300   K      1       12        0        0        0        0        1
17400   K1        32 ROUTE KEUKA LAKE OUTFLOWS TO 12
17500   Y      0        0        0        0        1
17600   Y1     0        6        2
17700   K      0       12        0        0        0        0        1
17800   K1        33 SENECA LAKE INFLOWS B-2
17900   M      1       -1      524        0     3236        0        0        0        1
18000   P      0     21.5       39       53       61       72
18100   T      0        0        0        0        0        0      0.5     0.03
18200   U     12
18300   U1 26993    10631     6899     4332     2720     1706     1072  [illegible]      422      266
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18400   U1   167      70
18500   X    500    2800      1.6
18600   K      2      12        0        0        0        0        1
18700   K1       34 COMBINE LOCAL FLOW B-2 AND ROUTED KEUKA LAKE OUTLET FLOWS
18800   K      1      12        0        0        0        0        1
18900   K1       35 SENECA LAKE OUTFLOWS - MODIFIED PULS METHOD
19000   Y      0       0        0        1        1
19100   Y1     1                                                  534000
19200   Y2372000  414000   456000   500000   543000   586000   630000   650000   674000   720000
19300   Y2800000 1200000
19400   Y3   700     700      700      700      700      700      700     1000     3000     3000
19500   Y3 15000   77000
19600   K      1      13        0        0        0        0        1
19700   K1       36 SENECA LAKE OUTFLOWS ROUTED TO 13
19800   Y      0       0        0        0        1
19900   Y1     0       2
20000   K      0      13        0        0        0        0        1
20100   K1       37 LOCAL INFLOW B-4
20200   M      1      -1       39        0     3236        0        0        0        1
20300   P      0    21.5       39       53       61       72
20400   T      0       0        0        0        0        0      0.5     0.05
20500   U     15
20600   U1   539    1094      796      549      378      260      179      123       85       58
20700   U1    40      28       19       11       11
20800   X     92     200      1.6
20900   K      2      13        0        0        0        0        1
21000   K1       38 COMBINE ROUTED SENECA LAKE OUTFLOW AND LOCAL FLOW B-4
21100   K      1      14        0        0        0        0        1
21200   K1       39 ROUTE HYDROGRAPH TO 14 (CAYUGA LAKE INFLOW)
21300   Y      0       0        0        0        1
21400   Y1     0       6        2
21500   K      0      14        0        0        0        0        1
21600   K1       40 LOCAL INFLOW B-5
21700   M      1      -1       36        0     3236        0        0        0        1
21800   P      0    21.5       39       53       61       72
21900   T      0       0        0        0        0        0      0.5     0.05
22000   U     12
22100   U1   895    1094      692      437      277      175      110       70       44       28
22200   U1    14      10
22300   X     92     200      1.6
22400   K      2      14        0        0        0        0        1
22500   K1       41 COMBINE FLOW B-5 WITH ROUTED FLOW
22600   K      0      14        0        0        0        0        1
22700   K1       42 CAYUGA LAKE INFLOW B-3
22800   M      1      -1      782        0     3236        0        0        0        1
22900   P      0    21.5       39       53       61       72
23000   T      0       0        0        0        0        0      0.5     0.03
23100   U     15
23200   U1 24903   15540    13526     9524     6529     4476     3069     2104     1443      989
23300   U1   678     465      319      219       81
23400   X   1000    1700      1.6
23500   K      2      14        0        0        0        0        1
23600   K1       43 COMBINE LOCAL INFLOW B-3 AND ROUTED FLOW
23700   K      1      14        0        0        0        0        1
23800   K1       44 CAYUGA LAKE OUTFLOW - MODIFIED PULS
23900   Y      0       0        0        1        1
24000   Y1     1       0        0        0        0        0   490000
24100   Y2375000  417000   460000   503000   516000   589500   634000   660000   727000   854500
24200   Y2982000
24300   Y3  1700    1700     1700     1700     3400     3400     3400     8700     8700    38510
24400   Y3103500
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24500   K      1     15      0      0      0      0      1
24600   K1       45 ROUTE CAYUGA LAKE OUTFLOWS TO NODE 15
24700   Y      0      0      0      0      1
24800   Y1     0      3      1
24900   K      2     15      0      0      0      0      1
25000   K1       46 COMBINE ROUTED FLOW WITH FLOW AT NODE 15
25100   K      1     18      0      0      0      0      1
25200   K1       47 ROUTE FLOWS TO NODE 18
25300   Y      0      0      0      0      1
25400   Y1     0      8      3
25500   K      0     16      0      0      0      0      1
25600   K1       48 LOCAL FLOW E-6
25700   M      1     -1    191      0   3236      0      0      0      1
25800   P      0   21.5     39     53     61     72
25900   T      0      0      0      0      0      0    0.5   0.06
26000   U     16
26100   U1  3851   5102   3130   2469   1710   1175    808    555    381    262
26200   U1   180    123     85     75     70     27
26300   X    140    400    1.6
26400   K      1     18      0      0      0      0      1
26500   K1       49 ROUTE LOCAL FLOW E-6 TO NODE 18
26600   Y      0      0      0      0      1
26700   Y1     0      2
26800   K      2     16      0      0      0      0      1
26900   K1       50 COMBINE ROUTED FLOW W/ FLOW AT NODE 18
27000   K      0     17      0      0      0      0      1
27100   K1       51 READ OWASCO INFLOW C-1
27200   M      1     -1    201      0   3236      0      0      0      1
27300   P      0   21.5     39     53     61     72
27400   T      0      0      0      0      0      0   0.75    .05
27500   U     10
27600   U1  6633   5878   4280   2273   1200    633    334    176     93     30
27700   X    450   1000    1.6
27800   K      1     17      0      0      0      0      1
27900   K1       52 OWASCO LAKE INFLOWS - MODIFIED PULS METHOD
28000   Y      0      0      0      1      1
28100   Y1     1      0      0      0      0      0  92000
28200   Y2 66000  73200  79900  86500  93200  99800 106500 113200 119600 126500
28300   Y2152900 205700
28400   Y3   600    600    600   1100   1700   2300   2860   3400   3400   3400
28500   Y3 24000  69100
28600   K      1     18      0      0      0      0      1
28700   K1       53 ROUTE OWASCO LAKE OUTLET FLOWS
28800   Y      0      0      0      0      1
28900   Y1     0      7      3
29000   K      2     18      0      0      0      0      1
29100   K1       54 COMBINE FLOWS WITH FLOWS AT NODE 18
29200   K      0     18      0      0      0      0      1
29300   K1       55 READ LOCAL FLOW C-6
29400   M      1     -1     19      0   3236      0      0      0      1
29500   P      0   21.5     39     53     61     72
29600   T      0      0      0      0      0      0    0.5   0.06
29700   U     16
29800   U1   157    368    352    268    205    156    119     91     70     53
29900   U1    40     26     23     18     14     10      8      6
30000   X     90    200    1.6
30100   K      2     18      0      0      0      0      1
30200   K1       56 COMBINE LOCAL FLOW C-6 WITH FLOW AT NODE 18
30300   K      1     21      0      0      0      0      1
30400   K1       57 ROUTE FLOW AT 18 TO NODE 21
30500   Y      0      0      0      0      1
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30600   Y1     0      7      3
30700   K      0     19      0      0      0      0      1
30800   K1        58 LOCAL INFLOW E-7
30900   M      1     -1     98      0   3236      0      0      0      1
31000   P      0   21.5     39     53     61     72
31100   T      0      0      0      0      0      0    0.5   0.06
31200   U     11
31300   U1  2769   3138   1870   1115    664    396    236    141     84     50
31400   U1    19
31500   X    120    400    1.6
31600   K      1     21      0      0      0      0      1
31700   K1        59 ROUTE LOCAL FLOW TO NODE 21
31800   Y      0      0      0      0      1
31900   Y1     0      6      2
32000   K      2     21      0      0      0      0      1
32100   K1        60 COMBINE ROUTED FLOW WITH FLOW AT 21
32200   K      0     20      0      0      0      0      1
32300   K1        61 SKANEATELES LAKE INFLOWS
32400   M      1     -1     74      0   3236      0      0      0      1
32500   P      0   21.5     39     53     61     72
32600   T      0      0      0      0      0      0   0.75   0.05
32700   U      5
32800   U1  6839    791    232     56     10
32900   X    250    500    1.6
33000   K      1     20      0      0      0      0      1
33100   K1        62 SKANEATELES LAKE OUTFLOWS
33200   Y      0      0      0      1      1
33300   Y1     1      0      0      0      0      0      0
33400   Y2     0  17323  34756  52184 104368 208736 243492
33500   Y3     0    353    747   1508   6403  13313  17359
33600   K      1     21      0      0      0      0      1
33700   K1        63 ROUTE SKANEATELES LAKE OUTFLOWS TO NODE 21
33800   Y      0      0      0      0      1
33900   Y1     0      6      2
34000   K      2     21      0      0      0      0      1
34100   K1        64 COMBINE ROUTED LAKE OUTFLOW WITH FLOW AT NODE 21
34200   K      0     21      0      0      0      0      1
34300   K1        65 LOCAL FLOW C-7
34400   M      1     -1     27      0   3236      0      0      0      1
34500   P      0   21.5     39     53     61     72
34600   T      0      0      0      0      0      0    0.5   0.06
34700   U     11
34800   U1   496    946    581    351    212    127     77     46     28     17
34900   U1     7
35000   X     90    200    1.6
35100   K      2     21      0      0      0      0      1
35200   K1        66 COMBINE LOCAL FLOW C-7 WITH FLOWS AT NODE 21
35300   K      1     22      0      0      0      0      1
35400   K1        67 ROUTING TO NODE 22
35500   Y      0      0      0      0      1
35600   Y1     0      4      1
35700   K      0     22      0      0      0      0      1
35800   K1        68 LOCAL FLOW E-8
35900   M      1     -1     98      0   3236      0      0      0      1
36000   P      0   21.5     39     53     61     72
36100   T      0      0      0      0      0      0    0.5   0.06
36200   U      7
36300   U1  4887   3059   1402    642    259    135     42
36400   X    120    400    1.6
36500   K      2     22      0      0      0      0      1
36600   K1        69 COMBINE ROUTED FLOW AND LOCAL FLOW AT NODE 22
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36700   K      1      22      0      0      0      0      1
36800   K1      TO BALDWINSVILLE POOL - MODIFIED PULS METHOD
36900   Y      0       0      0      1      1
37000   Y1     1       0      0      0      0      0     -1
37100   Y2     0    6500  13650  21320  34100  48750  62400  76375  107500
37200   Y3  3960    5915   9029  12937  23274  37200  55680  80859  109900
37300   K     99
37400   A
37500   A
37600   A
37700   A
37800   A
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PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT	1
ROUTE HYDROGRAPH TO	2
RUNOFF HYDROGRAPH AT	2
COMBINE 2 HYDROGRAPHS AT	2
ROUTE HYDROGRAPH TO	6
RUNOFF HYDROGRAPH AT	6
COMBINE 2 HYDROGRAPHS AT	6
RUNOFF HYDROGRAPH AT	3
ROUTE HYDROGRAPH TO	6
COMBINE 2 HYDROGRAPHS AT	6
RUNOFF HYDROGRAPH AT	4
ROUTE HYDROGRAPH TO	4
ROUTE HYDROGRAPH TO	5
RUNOFF HYDROGRAPH AT	5
COMBINE 2 HYDROGRAPHS AT	5
ROUTE HYDROGRAPH TO	56
RUNOFF HYDROGRAPH AT	56
COMBINE 2 HYDROGRAPHS AT	56
ROUTE HYDROGRAPH TO	6
COMBINE 2 HYDROGRAPHS AT	6
ROUTE HYDROGRAPH TO	8
RUNOFF HYDROGRAPH AT	7
ROUTE HYDROGRAPH TO	8
COMBINE 2 HYDROGRAPHS AT	8
ROUTE HYDROGRAPH TO	10
RUNOFF HYDROGRAPH AT	9
ROUTE HYDROGRAPH TO	10
COMBINE 2 HYDROGRAPHS AT	10
ROUTE HYDROGRAPH TO	15
RUNOFF HYDROGRAPH AT	11
ROUTE HYDROGRAPH TO	11
ROUTE HYDROGRAPH TO	12
RUNOFF HYDROGRAPH AT	12
COMBINE 2 HYDROGRAPHS AT	12
ROUTE HYDROGRAPH TO	12
ROUTE HYDROGRAPH TO	13
RUNOFF HYDROGRAPH AT	13
COMBINE 2 HYDROGRAPHS AT	13
ROUTE HYDROGRAPH TO	14
RUNOFF HYDROGRAPH AT	14
COMBINE 2 HYDROGRAPHS AT	14
RUNOFF HYDROGRAPH AT	14
COMBINE 2 HYDROGRAPHS AT	14
ROUTE HYDROGRAPH TO	14
ROUTE HYDROGRAPH TO	15
COMBINE 2 HYDROGRAPHS AT	15
ROUTE HYDROGRAPH TO	18
RUNOFF HYDROGRAPH AT	16
ROUTE HYDROGRAPH TO	18
COMBINE 2 HYDROGRAPHS AT	18
RUNOFF HYDROGRAPH AT	17
ROUTE HYDROGRAPH TO	17
ROUTE HYDROGRAPH TO	18
COMBINE 2 HYDROGRAPHS AT	18
RUNOFF HYDROGRAPH AT	18
COMBINE 2 HYDROGRAPHS AT	18
ROUTE HYDROGRAPH TO	21
RUNOFF HYDROGRAPH AT	19
ROUTE HYDROGRAPH TO	2

COMBINE 2 HYDROGRAPHS AT	21
RUNOFF HYDROGRAPH AT	20
ROUTE HYDROGRAPH TO	20
ROUTE HYDROGRAPH TO	21
COMBINE 2 HYDROGRAPHS AT	21
RUNOFF HYDROGRAPH AT	21
COMBINE 2 HYDROGRAPHS AT	21
ROUTE HYDROGRAPH TO	22
RUNOFF HYDROGRAPH AT	22
COMBINE 2 HYDROGRAPHS AT	22
ROUTE HYDROGRAPH TO	22
END OF NETWORK	

```
********************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
 LAST MODIFICATION  26 FEB 79
********************************

          TIME OF EXECUTION     27-AUG-80   08:13:58


                          ANALYSIS OF DAM OVERTIPPING USING RATIOS OF PMF
                        HYDROLOGIC-HYDRAULIC ANALYSIS OF SAFETY OF LOCK 24 DAM
                            RATIOS OF PMF ROUTED THROUGH THE RESERVOIR

                                      JOB SPECIFICATION
        NQ       NHR      NMIN      IDAY      IHR      IMIN     METRC      IPLT      IPRT     NSTAN
        40         6         0         0        0         0         0         0         4         0
                                     JOPER      NWT     LROPT     TRACE
                                         5        0         0         0


                              MULTI-PLAN ANALYSES TO BE PERFORMED
                                 NPLAN= 1 NRTIO= 6 LRTIO= 1
          RTIOS=    0.20     0.40     0.50     0.60     0.80     1.00


**********          **********          **********          **********          **********

                                 SUB-AREA RUNOFF COMPUTATION

           1 BARGE CANAL LOCK 30 AT MACEDON (SUB AREA A1)

                       ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
                           1        0        0        0        0        0        1        0        0

                                          HYDROGRAPH DATA
        IHYDG     IUHG    TAREA      SNAP   TRSDA     TRSPC    RATIO    ISNOW    ISAME    LOCAL
           -1        0   100.00      0.00 3236.00      0.00    0.000        0        1        0


**********          **********          **********          **********          **********

                                     HYDROGRAPH ROUTING

           2 BARGE CANAL LOCK 29 PALMYRA (ROUTED FLOW FROM LOCK 30)

                       ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
                           2        1        0        0        0        0        1        0        0
                                            ROUTING DATA
             QLOSS    CLOSS      AVG     IRES    ISAME     IOPT     IPMP              LSTR
               0.0    0.000     0.00        0        1        0        0                 0

                       NSTPS    NSTDL      LAG    AMSKK        X      TSK    STORA   ISPRAT
                           0        3        1    0.000    0.000    0.000       0.        0


**********          **********          **********          **********          **********

                                 SUB-AREA RUNOFF COMPUTATI
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```
3 GANARGUA CREEK LOCAL INFLOWS TO LOCK 29 (SUB-AREA E-1)

              ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                  2       0       0       0       0       0       1       0       0

                                  HYDROGRAPH DATA
  IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
      1      -1  147.00    0.00 3236.00    0.00   0.000       0       1       0

                                    PRECIP DATA
          SPFE     PMS      R6     R12     R24     R48     R72     R96
          0.00   21.50   39.00   53.00   61.00   72.00    0.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.928

                                    LOSS DATA
  LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
      0    0.00    0.00    1.00    0.00    0.00    1.00    0.50    0.05    0.00    0.00

                                  RECESSION DATA
                STRTQ=  140.00     QRCSN=  550.00     RTIOR= 1.60

        0                                END-OF-PERIOD FLOW
  MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS   COMP Q     MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS

                                                                    SUM  14.37  12.12   2.24
                                                                      ( 365.)( 308.)(  57.)(


        **********          **********          **********          *********          **********

                                  COMBINE HYDROGRAPHS

4 COMBINED ROUTED AND LOCAL FLOWS AT LOCK 29

              ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                  2       2       0       0       0       0       1       0       0


        **********          **********          **********          **********          **********

                                  HYDROGRAPH ROUTING

5 ROUTED HYDROGRAPH TO LOCK 27 AT LYONS

              ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                  6       1       0       0       0       0       1       0       0
                                  ROUTING DATA
     QLOSS   CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
       0.0   0.000    0.00       0       1       0       0               0

             NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                 0       8       3   0.000   0.000   0.000      0.       0


        **********          **********          **********          **********          **********
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SUB-AREA RUNOFF COMPUTATION

6 LOWER GANARAGUAL LOCAL INFLOWS VICINITY OF LOCK 27 (SUB-AREA E-2)

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
6	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	118.00	0.00	3236.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.50	0.05	0.00	0.00

RECESSION DATA

STRTQ= 120.00 QRCSN= 470.00 RTIOR= 1.60

0 END-OF-PERIOD FLOW

MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q

SUM 14.37 12.12 2.24 155692.
(365.)(308.)(57.)(4408.71)

********** ********** ********** ********** **********

COMBINE HYDROGRAPHS

7 COMBINED AND LOCAL FLOWS AT LOCK 27

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
6	2	0	0	0	0	1	0	0

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

8 LOCAL FLOW E-3 (AREA LOCAL TO BARGE CANAL E-29 TO E-27)

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
3	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	51.00	0.00	3236.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

```
                                        LOSS DATA
   LROPT    STRKR    DLTKR    RTIOL    ERAIN    STRKS    RTIOK    STRTL    CNSTL    ALSMX    RTIMP
       0     0.00     0.00     1.00     0.00     0.00     1.00     0.50     0.05     0.00     0.00

                                      RECESSION DATA
                       STRTQ=   100.00     QRCSN=   200.00     RTIOR= 1.60

0                                   END-OF-PERIOD FLOW
MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS   COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                      SUM  14.37  12.12   2.24    68228.
                                                                         ( 365.)( 308.)(  57.)( 1932.00)


      **********          **********          **********          **********          **********

                                   HYDROGRAPH ROUTING

             9 ROUTED FLOW E-3 TO LYONS (NODE 6)

                   ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
                       6        1        0        0        0        0        1        0        0
                                         ROUTING DATA
             QLOSS    CLOSS      AVG     IRES    ISAME     IOPT     IPMP               LSTR
               0.0    0.000     0.00        0        1        0        0                  0

                   NSTPS    NSTDL      LAG    AMSKK        X      TSK    STORA   ISPRAT
                       0        5        2    0.000    0.000    0.000       0.        0


      **********          **********          **********          **********          **********

                                   COMBINE HYDROGRAPHS

             10 COMBINE FLOWS AT NODE 6

                   ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
                       6        2        0        0        0        0        1        0        0


      **********          **********          **********          **********          **********

                                SUB-AREA RUNOFF COMPUTATION

             11 CANANDAIGUA LAKE INFLOW

                   ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
                       4        0        0        0        0        0        1        0        0

                                        HYDROGRAPH DATA
          IHYDG     IUHG    TAREA     SNAP    TRSDA    TRSPC    RATIO    ISNOW    ISAME    LOCAL
              1       -1   184.00     0.00  3236.00     0.00    0.000        0        1        0

                                          PRECIP DATA
                SPFE      PMS       R6      R12      R24      R48      R72      R96
                0.00    21.50    39.00    53.00    61.00    72.00     0.00     0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.928
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```
                                                LOSS DATA
         LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRIL   CNSTL   ALSMX   RTIMP
             0    0.00    0.00    1.00    0.00    0.00    1.00    1.25    0.03    0.00    0.00

                                              RECESSION DATA
                               STRTQ=  300.00    QRCSN= 1000.00    RTIOR= 1.60

          0                                   END-OF-PERIOD FLOW
    MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS   COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                          SUM  14.37  12.13   2.24   256548.
                                                                             ( 365.)( 308.)(  57.)( 7264.63)


         **********         **********         **********         **********         **********

                                              HYDROGRAPH ROUTING

                      12 CANANDAIGUA LAKE OUT FLOW USING MODIFIED PULS METHOD

                              ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                                  4       1       0       0       0       0       1       0       0
                                                     ROUTING DATA
                      QLOSS   CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
                        0.0   0.000    0.00       1       1       0       0               0

                              NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                                  1       0       0   0.000   0.000   0.000  51000.       0

STORAGE     10700.00   21300.00   31900.00   42500.00   53100.00   63700.00   74300.00   84900.00   95500.00  106100.00
           212500.00  319000.00

OUTFLOW        50.00      50.00      50.00      50.00     280.00     600.00    1000.00    1560.00    2250.00    3000.00
            63000.00  200366.00


         **********         **********         **********         **********         **********

                                              HYDROGRAPH ROUTING

                      13 ROUTED OUTFLOW TO FLINT CREEK MOUTH

                              ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                                  5       1       0       0       0       0       1       0       0
                                                     ROUTING DATA
                      QLOSS   CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
                        0.0   0.000    0.00       0       1       0       0               0

                              NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                                  0      12       5   0.000   0.000   0.000      0.       0


         **********         **********         **********         **********         **********

                                          SUB-AREA RUNOFF COMPUTATION
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McFARLAND - JOHNSON ENGINEERS, INC.

```
14 FLINT CREEK INFLOW A-2

                 ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                     5       0       0       0       0       0       1       0       0

                                        HYDROGRAPH DATA
        IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
            1      -1  102.00    0.00 3236.00    0.00   0.000       0       1       0

                                          PRECIP DATA
             SPFE     PMS      R6     R12     R24     R48     R72     R96
             0.00   21.50   39.00   53.00   61.00   72.00    0.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.928

                                           LOSS DATA
      LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
          0    0.00    0.00    1.00    0.00    0.00    1.00    0.50    0.06    0.00    0.00

                                        RECESSION DATA
                     STRTQ=   90.00    QRCSN= 2000.00    RTIOR= 1.60

     0                                 END-OF-PERIOD FLOW
   MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS   COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS   COMP Q

                                                               SUM  14.37  11.81   2.56  144965.
                                                                  ( 365.)( 300.)(  65.)( 4104.95)


      **********        **********        **********        **********        **********

                                      COMBINE HYDROGRAPHS

 15 COMBINE ROUTED CANANDAIGUA OUTFLOWS AND FLINT CR INFLOWS

                 ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                     5       2       0       0       0       0       1       0       0


      **********        **********        **********        **********        **********

                                      HYDROGRAPH ROUTING

 16 ROUTED TO LOCK 27

                 ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                    56       1       0       0       0       0       1       0       0
                                         ROUTING DATA
          QLOSS   CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
            0.0   0.000    0.00       0       1       0       0               0

                 NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                     0       7       3   0.000   0.000   0.000      0.       0


      **********        **********        **********        **********        **********

                                  SUB-AREA RUNOFF COMPUTATI
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:FARLAND - JOHNSON ENGINEERS, INC.

17 OUTLET LOCAL FLOW A-3

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
56	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	155.00	0.00	3236.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.60	0.06	0.00	0.00

RECESSION DATA

STRTQ= 150.00 QRCSN= 200.00 RTIOR= 1.60

0 END-OF-PERIOD FLOW

MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q

SUM 14.37 11.78 2.59 199666.
(365.)(299.)(66.)(5653.91)

********** ********** ********** ********** **********

COMBINE HYDROGRAPHS

18 COMBINE LOCAL FLOW A-3 WITH FLOW AT LOCK 27

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
56	2	0	0	0	0	1	0	0

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

19 ROUTE OUTLET TO CANAL

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
6	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	0	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
0	1	0	0.000	0.000	0.000	0.	0

********** ********** ********** ********** **********

COMBINE HYDROGRAPHS

20 COMBINE FLOW AT 6(OUTLET FLOW + E-1, E-2, E-3)

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
6	2	0	0	0	0	1	0	0

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

21 ROUTE FLOWS AT LOCK 27 TO NODE 8

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
8	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	0	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
0	8	3	0.000	0.000	0.000	0.	0

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

22 LOCAL INFLOW LOCK 27 TO LOCK 26 (E4)

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
7	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	89.00	0.00	3236.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.50	0.06	0.00	0.00

RECESSION DATA

STRTQ= 100.00 QRCSN= 360.00 RTIOR= 1.60

0 END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
									SUM	14.37	11.81	2.56	116859.
										(365.)	(300.)	(65.)	(3309.08)

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

23 ROUTE FLOWS AT LOCK 26 TO NODE 8

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
8	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP		LSTR
0.0	0.000	0.00	0	1	0	0		0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
0	2	0	0.000	0.000	0.000	0.	0

********** ********** ********** ********** **********

COMBINE HYDROGRAPHS

24 COMBINE ROUTED AND LOCAL FLOWS AT NODE 8

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
8	2	0	0	0	0	1	0	0

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

25 ROUTE FLOWS AT NODE 8 TO NODE 10

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
10	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP		LSTR
0.0	0.000	0.00	0	1	0	0		0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
0	5	2	0.000	0.000	0.000	0.	0

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SUB-AREA RUNOFF COMPUTATION

26 LOCAL FLOW BETWEEN LOCK 26 AND LOCK 25 (E-5)

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
9	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	18.00	0.00	3236.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.50	0.06	0.00	0.00

RECESSION DATA

STRTQ= 90.00 QRCSN= 90.00 RTIOR= 1.60

0

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
									SUM	14.37	11.81	2.56	24784.
										(365.)	(300.)	(65.)	(701.80)

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

27 ROUTE INFLOW E-5 TO NODE 10

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
10	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	0	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
0	2	0	0.000	0.000	0.000	0.	0

********** ********** ********** ********** **********

COMBINE HYDROGRAPHS

28 COMBINE ROUTED FLOW WITH FLOW AT NODE 10

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
10	2	0	0	0	0	1	0	0

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

29 ROUTE FLOWS AT NODE 10 TO NODE 15

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
15	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	0	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
0	5	2	0.000	0.000	0.000	0.	0

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

30 LOCAL INFLOW B-1 INTO KEUKA LAKE

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
11	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	183.00	0.00	3236.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.50	0.03	0.00	0.00

RECESSION DATA

STRTQ= 100.00 QRCSN= 800.00 RTIOR= 1.60

0 END-OF-PERIOD FLOW

MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q

SUM 14.37 11.91 2.46 246833.
(365.)(302.)(62.)(6989.53)

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

31 KEUKA LAKE OUTFLOW W/ MODIFIED PULS

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
11	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	147000.	0

STORAGE	107000.00	129500.00	141000.00	153500.00	172000.00	178000.00	191000.00	204000.00	217000.00
OUTFLOW	120.00	320.00	445.00	530.00	575.00	670.00	890.00	1130.00	1470.00

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HYDROGRAPH ROUTING

32 ROUTE KEUKA LAKE OUTFLOWS TO 12

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*         **********          **********          **********          **********

                    SUB-AREA RUNOFF COMPUTATION

 30 LOCAL INFLOW B-1 INTO KEUKA LAKE

          ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME  ISTAGE   IAUTO
            11        0        0        0        0        0        1       0       0

                              HYDROGRAPH DATA
YDG     IUHG    TAREA     SNAP   TRSDA    TRSPC    RATIO    ISNOW    ISAME    LOCAL
 1       -1   183.00     0.00 3236.00     0.00    0.000        0        1        0

                               PRECIP DATA
    SPFE      PMS      R6      R12      R24      R48      R72      R96
    0.00    21.50   39.00    53.00    61.00    72.00     0.00     0.00
ROGRAM IS 0.928

                              LOSS DATA
STRKR    DLTKR    RTIOL    ERAIN    STRKS    RTIOK    STRTL    CNSTL    ALSMX    RTIMP
 0.00     0.00     1.00     0.00     0.00     1.00     1.50     0.03     0.00     0.00

                             RECESSION DATA
          STRTQ=  100.00     QRCSN=  800.00     RTIOR= 1.60

                            END-OF-PERIOD FLOW
IOD    RAIN    EXCS    LOSS     COMP Q        MO.DA  HR.MN  PERIOD    RAIN    EXCS    LOSS     COMP Q

                                                            SUM  14.37   11.91    2.46   246833.
                                                                ( 365.)( 302.)(  62.)( 6989.53)


          **********          **********          **********          **********

                         HYDROGRAPH ROUTING

 31 KEUKA LAKE OUTFLOW W/ MODIFIED PULS

          ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME  ISTAGE   IAUTO
            11        1        0        0        0        0        1       0       0
                               ROUTING DATA
 QLOSS    CLOSS      AVG     IRES    ISAME     IOPT     IPMP              LSTR
   0.0    0.000     0.00       1        1        0        0                 0

          NSTPS    NSTDL      LAG    AMSKK        X      TSK    STORA  ISPRAT
              1        0        0    0.000    0.000    0.000 147000.        0

129500.00   141000.00   153500.00   172000.00   178000.00   191000.00   204000.00   217000.00   328550.00

   320.00      445.00      530.00      575.00      670.00      890.00     1130.00     1470.00   126000.00


          **********          **********          **********          **********

                         HYDROGRAPH ROUTING

32 ROUTE KEUKA LAKE OUTFLOWS TO 12
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2

McFARLAND - JOHNSON ENGINEERS, INC.

```
                    ISTAQ    ICOMP    IECON    ITAPE    JPLT    JPRT    INAME  ISTAGE   IAUTO
                       12        1        0        0       0       0        1       0       0
                                            ROUTING DATA
             QLOSS    CLOSS      AVG     IRES    ISAME    IOPT    IPMP                  LSTR
               0.0    0.000     0.00        0        1       0       0                     0

                    NSTPS    NSTDL      LAG    AMSKK       X     TSK    STORA  ISPRAT
                        0        0        2    0.000   0.000   0.000      0.        0


        **********          **********          **********          **********          **********

                                    SUB-AREA RUNOFF COMPUTATION

             33 SENECA LAKE INFLOWS B-2

                    ISTAQ    ICOMP    IECON    ITAPE    JPLT    JPRT    INAME  ISTAGE   IAUTO
                       12        0        0        0       0       0        1       0       0

                                         HYDROGRAPH DATA
        IHYDG     IUHG    TAREA     SNAP    TRSDA    TRSPC    RATIO    ISNOW    ISAME    LOCAL
            1       -1   524.00     0.00  3236.00     0.00    0.000        0        1        0

                                            PRECIP DATA
                   SPFE      PMS       R6      R12      R24      R48      R72      R96
                   0.00    21.50    39.00    53.00    61.00    72.00     0.00     0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.928

                                             LOSS DATA
      LROPT    STRKR    DLTKR    RTIOL    ERAIN    STRKS    RTIOK    STRTL    CNSTL    ALSMX    RTIMP
          0     0.00     0.00     1.00     0.00     0.00     1.00     0.50     0.03     0.00     0.00

                                          RECESSION DATA
                      STRTQ=   500.00     QRCSN= 2800.00     RTIOR= 1.60

     0                                     END-OF-PERIOD FLOW
 MO.DA  HR.MN  PERIOD    RAIN   EXCS   LOSS    COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                     SUM  14.37   12.75   1.62   758979.
                                                                        ( 365.)( 324.)(  41.)(21491.89)


        **********          **********          **********          **********          **********

                                      COMBINE HYDROGRAPHS

             34 COMBINE LOCAL FLOW B-2 AND ROUTED KEUKA LAKE OUTLET FLOWS

                    ISTAQ    ICOMP    IECON    ITAPE    JPLT    JPRT    INAME  ISTAGE   IAUTO
                       12        2        0        0       0       0        1       0       0


        **********          **********          **********          **********          **********

                                       HYDROGRAPH ROUTING
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```
35 SENECA LAKE OUTFLOWS - MODIFIED PULS METHOD

                ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                   12       1       0       0       0       0       1       0       0
                                      ROUTING DATA
      QLOSS    CLOSS      AVG    IRES   ISAME    IOPT    IPMP            LSTR
        0.0    0.000     0.00       1       1       0       0               0

                NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                    1       0       0   0.000   0.000   0.000 534000.       0

STORAGE   372000.00  414000.00  456000.00  500000.00  543000.00  586000.00  630000.00  650000.00  674000.00  720000.00
          800000.00 1200000.00

OUTFLOW      700.00     700.00     700.00     700.00     700.00     700.00     700.00    1000.00    3000.00    3000.00
           15000.00   77000.00


      **********          **********          **********          **********          **********

                                     HYDROGRAPH ROUTING

36 SENECA LAKE OUTFLOWS ROUTED TO 13

                ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                   13       1       0       0       0       0       1       0       0
                                      ROUTING DATA
      QLOSS    CLOSS      AVG    IRES   ISAME    IOPT    IPMP            LSTR
        0.0    0.000     0.00       0       1       0       0               0

                NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                    0       2       0   0.000   0.000   0.000      0.       0


      **********          **********          **********          **********          **********

                                  SUB-AREA RUNOFF COMPUTATION

37 LOCAL INFLOW B-4

                ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                   13       0       0       0       0       0       1       0       0

                                      HYDROGRAPH DATA
        IHYDG    IUHG    TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
            1      -1    39.00    0.00 3236.00    0.00   0.000       0       1       0

                                        PRECIP DATA
              SPFE     PMS      R6     R12     R24     R48     R72     R96
              0.00   21.50   39.00   53.00   61.00   72.00    0.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.928

                                         LOSS DATA
     LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
         0    0.00    0.00    1.00    0.00    0.00    1.00    0.50    0.05    0.00    0.00

                                       RECESSION DATA
                    STRTQ=   92.00   QRCSN=  200.00   RTIOR= 1.60
```

0 END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
									SUM	14.37	12.12	2.24	54130.
										(365.)	(308.)	(57.)	(1532.79)

********** ********** ********** ********** **********

COMBINE HYDROGRAPHS

38 COMBINE ROUTED SENECA LAKE OUTFLOW AND LOCAL FLOW B-4

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
13	2	0	0	0	0	1	0	0

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

39 ROUTE HYDROGRAPH TO 14 (CAYUGA LAKE INFLOW)

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
14	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	0	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
0	0	2	0.000	0.000	0.000	0.	0

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

40 LOCAL INFLOW B-5

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
14	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	36.00	0.00	3236.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.50	0.05	0.00	0.00

RECESSION DATA

STRTQ= 92.00 QRCSN= 200.00 RTIOR= 1.6

McFARLAND - JOHNSON ENGINEERS, INC.

0
END-OF-PERIOD FLOW

MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q

SUM 14.37 12.12 2.24 50339.
(365.)(308.)(57.)(1425.44)

********** ********** ********** ********** **********

COMBINE HYDROGRAPHS

41 COMBINE FLOW B-5 WITH ROUTED FLOW

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
14	2	0	0	0	0	1	0	0

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

42 CAYUGA LAKE INFLOW B-3

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
14	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	782.00	0.00	3236.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.50	0.03	0.00	0.00

RECESSION DATA
STRTQ= 1000.00 QRCSN= 1700.00 RTIOR= 1.60

0
END-OF-PERIOD FLOW

MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q MO.DA HR.MN PERIOD RAIN EXCS LOSS COMP Q

SUM 14.37 12.75 1.62 1103464.
(365.)(324.)(41.)(31246.61)

********** ********** ********** ********** **********

COMBINE HYDROGRAPHS

43 COMBINE LOCAL INFLOW B-3 AND ROUTED FLOW

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                         ISTAQ   ICOMP   IECON   ITAPE   JPLT    JPRT   INAME  ISTAGE   IAUTO
                           14       2       0       0       0       0       1       0       0


          **********         **********         **********         **********         **********

                                        HYDROGRAPH ROUTING

                 44 CAYUGA LAKE OUTFLOW - MODIFIED PULS

                         ISTAQ   ICOMP   IECON   ITAPE   JPLT    JPRT   INAME  ISTAGE   IAUTO
                           14       1       0       0       0       0       1       0       0
                                            ROUTING DATA
                  QLOSS   CLOSS    AVG     IRES   ISAME    IOPT    IPMP            LSTR
                    0.0   0.000   0.00       1       1       0      .0.              0

                         NSTPS   NSTDL     LAG   AMSKK      X      TSK   STORA  ISPRAT
                             1       0       0   0.000   0.000   0.000 490000.      0

STORAGE    375000.00  417000.00  460000.00  503000.00  545000.00  589500.00  634000.00  660000.00  727000.00  854500.00
           982000.00

OUTFLOW      1700.00    1700.00    1700.00    1700.00    3400.00    3400.00    3400.00    8700.00    8700.00   38510.00
           103500.00


          **********         **********         **********         **********         **********

                                        HYDROGRAPH ROUTING

                 45 ROUTE CAYUGA LAKE OUTFLOWS TO NODE 15

                         ISTAQ   ICOMP   IECON   ITAPE   JPLT    JPRT   INAME  ISTAGE   IAUTO
                           15       1       0       0       0       0       1       0       0
                                            ROUTING DATA
                  QLOSS   CLOSS    AVG     IRES   ISAME    IOPT    IPMP            LSTR
                    0.0   0.000   0.00       0       1       0       0               0

                         NSTPS   NSTDL     LAG   AMSKK      X      TSK   STORA  ISPRAT
                             0       3       1   0.000   0.000   0.000     0.       0


          **********         **********         **********         **********         **********

                                        COMBINE HYDROGRAPHS

                 46 COMBINE ROUTED FLOW WITH FLOW AT NODE 15

                         ISTAQ   ICOMP   IECON   ITAPE   JPLT    JPRT   INAME  ISTAGE   IAUTO
                           15       2       0       0       0       0       1       0       0


          **********         **********         **********         **********         **********

                                        HYDROGRAPH ROUTING

                 47 ROUTE FLOWS TO NODE 18
```

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
18	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	0	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
0	8	3	0.000	0.000	0.000	0.	0

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

48 LOCAL FLOW E-6

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
16	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	191.00	0.00	3236.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.50	0.06	0.00	0.00

RECESSION DATA

STRTQ= 140.00 QRCSN= 400.00 RTIOR= 1.60

0

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
									SUM	14.37	11.81	2.56	242885.
										(365.)	(300.)	(65.)	(6877.74)

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

49 ROUTE LOCAL FLOW E-6 TO NODE 18

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
18	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	0	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
0	2	0	0.000	0.000	0.000	0.	0

********** ********** ********** ********** **********

COMBINE HYDROGRAPHS

50 COMBINE ROUTED FLOW W/ FLOW AT NODE 18

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
18	2	0	0	0	0	1	0	0

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

51 HEAD OWASCO INFLOW C-1

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
17	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	201.00	0.00	3236.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.75	0.05	0.00	0.00

RECESSION DATA

STRTQ= 450.00 QRCSN= 1000.00 RTIOR= 1.60

0 END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
									SUM	14.37	11.97	2.39	276691.
										(365.)	(304.)	(61.)	(7835.01)

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

52 OWASCO LAKE INFLOWS - MODIFIED PULS METHOD

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
17	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	92000.	0

```
STORAGE     66000.00    73200.00    79900.00    86500.00    93200.00    99800.00   106500.00   113200.00   119800.00   126500.00
           152900.00   205700.00

OUTFLOW       600.00      600.00      600.00     1100.00     1700.00     2300.00     2860.00     3400.00     3400.00     3400.00
            24000.00    69100.00


        **********          **********          **********          **********          **********

                                        HYDROGRAPH ROUTING

              53 ROUTE OWASCO LAKE OUTLET FLOWS

                       ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                          18       1       0       0       0       0       1       0       0
                                             ROUTING DATA
                 QLOSS   CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
                   0.0   0.000    0.00       0       1       0       0               0

                       NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                           0       7       3   0.000   0.000   0.000      0.       0


        **********          **********          **********          **********          **********

                                       COMBINE HYDROGRAPHS

              54 COMBINE FLOWS WITH FLOWS AT NODE 18

                       ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                          18       2       0       0       0       0       1       0       0


        **********          **********          **********          **********          **********

                                     SUB-AREA RUNOFF COMPUTATION

              55 READ LOCAL FLOW C-6

                       ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                          18       0       0       0       0       0       1       0       0

                                          HYDROGRAPH DATA
            IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
                1      -1   19.00    0.00 3236.00    0.00   0.000       0       1       0

                                            PRECIP DATA
                   SPFE     PMS      R6     R12     R24     R48     R72     R96
                   0.00   21.50   39.00   53.00   61.00   72.00    0.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.928

                                              LOSS DATA
          LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
              0    0.00    0.00    1.00    0.00    0.00    1.00    0.50    0.06    0.00    0.00

                                           RECESSION DATA
                       STRTQ=    90.00      QRCSN=   200.00      RTIOR=   1.60
```

```
     0                                                END-OF-PERIOD FLOW
 MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS    COMP Q

                                                                        SUM  14.37  11.81   2.56    20786.
                                                                           ( 365.)( 300.)(  65.)(  758.49)


        **********          **********          **********          **********          **********

                                           COMBINE HYDROGRAPHS

                     56 COMBINE LOCAL FLOW C-6 WITH FLOW AT NODE 18

                               ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                                  18       2       0       0       0       0       1       0       0


        **********          **********          **********          **********          **********

                                           HYDROGRAPH ROUTING

                     57 ROUTE FLOW AT 18 TO NODE 21

                               ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                                  21       1       0       0       0       0       1       0       0
                                                   ROUTING DATA
                     QLOSS     CLOSS     AVG    IRES   ISAME    IOPT    IPMP            LSTR
                       0.0     0.000    0.00       0       1       0       0               0

                               NSTPS   NSTDL     LAG   AMSKK       X     TSK   STORA  ISPRAT
                                   0       7       3   0.000   0.000   0.000      0.       0


        **********          **********          **********          **********          **********

                                        SUB-AREA RUNOFF COMPUTATION

                     58 LOCAL INFLOW E-7

                               ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                                  19       0       0       0       0       0       1       0       0

                                                   HYDROGRAPH DATA
                 IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
                     1      -1   98.00    0.00 3236.00    0.00   0.000       0       1       0

                                                     PRECIP DATA
                          SPFE     PMS      R6     R12     R24     R48     R72     R96
                          0.00   21.50   39.00   53.00   61.00   72.00    0.00    0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.928

                                                     LOSS DATA
              LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
                  0    0.00    0.00    1.00    0.00    0.00    1.00    0.50    0.06    0.00    0.00

                                                  RECESSION DATA
```

STRTQ= 120.00 QRCSN= 400.00 RTIOR= 1.60

0				END-OF-PERIOD FLOW									
MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
									SUM	14.37	11.81	2.56	130662.
										(365.)	(300.)	(65.)	(3699.93)

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HYDROGRAPH ROUTING

59 ROUTE LOCAL FLOW TO NODE 21

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
21	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	0	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
0	6	2	0.000	0.000	0.000	0.	0

********** ********** ********** ********** **********

COMBINE HYDROGRAPHS

60 COMBINE ROUTED FLOW WITH FLOW AT 21

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
21	2	0	0	0	0	1	0	0

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

61 SKANEATELES LAKE INFLOWS

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
20	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	74.00	0.00	3236.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.75	0.05	0.00	0.00

RECESSION DATA
STRTQ= 250.00 QRCSN= 500.00 RTIOR= 1.00

0 END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q

SUM 14.37 11.97 2.39 104801.
(365.)(304.)(61.)(2967.63)

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

62 SKANEATELES LAKE OUTFLOWS

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
20	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	0

STORAGE	0.00	17323.00	34756.00	52184.00	104368.00	208736.00	243492.00
OUTFLOW	0.00	353.00	747.00	1508.00	6403.00	13313.00	17359.00

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HYDROGRAPH ROUTING

63 ROUTE SKANEATELES LAKE OUTFLOWS TO NODE 21

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
21	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	0	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
0	6	2	0.000	0.000	0.000	0.	0

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COMBINE HYDROGRAPHS

64 COMBINE ROUTED LAKE OUTFLOW WITH FLOW AT NODE 21

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
21	2	0	0	0	0	1	0	0

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

65 LOCAL FLOW C-7

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
21	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	-1	27.00	0.00	3236.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	39.00	53.00	61.00	72.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.928

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.50	0.06	0.00	0.00

RECESSION DATA

STRTQ= 90.00 QRCSN= 200.00 RTIOR= 1.60

0

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
									SUM	14.37	11.81	2.56	37841.
										(365.)	(300.)	(65.)	(1071.54)

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COMBINE HYDROGRAPHS

66 COMBINE LOCAL FLOW C-7 WITH FLOWS AT NODE 21

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
21	2	0	0	0	0	1	0	0

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

67 ROUTING TO NODE 22

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
22	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	0	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
0	4	1	0.000	0.000	0.000	0.	0

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**********          **********          **********          **********          **********

                              SUB-AREA RUNOFF COMPUTATION

           68 LOCAL FLOW E-6

                       ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
                          22        0        0        0        0        0        1        0        0

                                        HYDROGRAPH DATA
          IHYDG     IUHG    TAREA     SNAP    TRSDA    TRSPC    RATIO    ISNOW    ISAME    LOCAL
              1       -1    98.00     0.00  3236.00     0.00    0.010        0        1        0

                                          PRECIP DATA
                  SPFE      PMS       R6      R12      R24      R48      R72      R96
                  0.00    21.50    39.00    53.00    61.00    72.10     0.00     0.00
TRSPC COMPUTED BY THE PROGRAM IS 0.928

                                           LOSS DATA
        LROPT    STRKR    DLTKR    RTIOL    ERAIN    STRKS    RTIOK    STRTL    CNSTL    ALSMX    RTIMP
            0     0.00     0.00     1.00     0.00     0.00     1.00     0.50     0.06     0.00     0.00

                                         RECESSION DATA
                            STRTQ=   120.00     QRCSN=   400.00     RTIOR= 1.60

       0                                END-OF-PERIOD FLOW
    MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS   COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS   COMP Q

                                                                          SUM  14.37  11.81   2.56  130265.
                                                                             ( 365.)( 300.)(  65.)( 3688.69)


**********          **********          **********          **********          **********

                                     COMBINE HYDROGRAPHS

           69 COMBINE ROUTED FLOW AND LOCAL FLOW AT NODE 22

                       ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
                          22        2        0        0        0        0        1        0        0


**********          **********          **********          **********          **********

                                      HYDROGRAPH ROUTING

           70 BALDWINSVILLE POOL - MODIFIED PULS METHOD

                       ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
                          22        1        0        0        0        0        1        0        0
                                          ROUTING DATA
              QLOSS    CLOSS      AVG     IRES    ISAME     IOPT     IPMP              LSTR
                0.0    0.000     0.00        1        1        0        0                 0

                       NSTPS    NSTDL      LAG   AMSKK        X      TSK    STORA   ISPRAT
                           1        0        0   0.000    0.000    0.000      -1.        0
```

STORAGE	0.00	6500.00	13650.00	21320.00	34100.00	48750.00	62400.00	76375.00	107500.00
OUTFLOW	3960.00	5915.00	9029.00	12937.00	23274.00	37200.00	55680.00	80859.00	109900.00

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PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIO 1 0.20	RATIO 2 0.40	RATIO 3 0.50	RATIO 4 0.60	RATIO 5 0.80	RATIO 6 1.00
				RATIOS APPLIED TO FLOWS					
HYDROGRAPH AT	1	100.00	1	78.	157.	196.	235.	314.	392.
		(259.00)		(2.22)(	4.44)(	5.55)(	6.66)(	8.88)(	11.10)(
ROUTED TO	2	100.00	1	78.	156.	195.	234.	311.	389.
		(259.00)		(2.20)(	4.41)(	5.51)(	6.61)(	8.82)(	11.02)(
HYDROGRAPH AT	2	147.00	1	6409.	12817.	16022.	19226.	25635.	32044.
		(380.73)		(181.47)(	362.95)(	453.69)(	544.42)(	725.90)(	907.37)(
2 COMBINED	2	247.00	1	6485.	12970.	16212.	19455.	25940.	32425.
		(639.73)		(183.63)(	367.27)(	459.09)(	550.90)(	734.54)(	918.17)(
ROUTED TO	6	247.00	1	3948.	7896.	9870.	11844.	15792.	19740.
		(639.73)		(111.79)(	223.59)(	279.48)(	335.38)(	447.17)(	558.97)(
HYDROGRAPH AT	6	118.00	1	2948.	5897.	7371.	8845.	11794.	14742.
		(305.62)		(83.49)(	166.98)(	208.73)(	250.47)(	333.96)(	417.46)(
2 COMBINED	6	365.00	1	6705.	13410.	16763.	20115.	26820.	33525.
		(945.35)		(189.87)(	379.73)(	474.67)(	569.60)(	759.47)(	949.33)(
HYDROGRAPH AT	3	51.00	1	4042.	8084.	10105.	12126.	16168.	20210.
		(132.09)		(114.45)(	228.91)(	286.14)(	343.36)(	457.82)(	572.27)(
ROUTED TO	6	51.00	1	2199.	4398.	5497.	6596.	8795.	10994.
		(132.09)		(62.26)(	124.53)(	155.66)(	186.79)(	249.05)(	311.31)(
2 COMBINED	6	416.00	1	7200.	14400.	18000.	21600.	28800.	36000.
		(1077.44)		(203.88)(	407.76)(	509.70)(	611.64)(	815.52)(	1019.40)(
HYDROGRAPH AT	4	184.00	1	16154.	32308.	40386.	48463.	64617.	80771.
		(476.56)		(457.44)(	914.87)(	1143.59)(	1372.31)(	1829.75)(	2287.18)(
ROUTED TO	4	184.00	1	905.	2085.	2802.	6179.	13864.	20866.
		(476.56)		(25.62)(	59.05)(	79.34)(	174.96)(	392.59)(	590.85)(
ROUTED TO	5	184.00	1	859.	1910.	2549.	3773.	7286.	11042.
		(476.56)		(24.32)(	54.09)(	72.17)(	106.84)(	206.33)(	312.66)(
HYDROGRAPH AT	5	102.00	1	2955.	5910.	7387.	8865.	11820.	14775.
		(264.18)		(83.67)(	167.35)(	209.18)(	251.02)(	334.69)(	418.37)(
2 COMBINED	5	286.00	1	3402.	6714.	8413.	10551.	15688.	21015.
		(740.74)		(96.33)(	190.11)(	238.23)(	298.77)(	444.24)(	595.09)(
ROUTED TO	56	286.00	1	2790.	5529.	6952.	8854.	13652.	18710.
		(740.74)		(78.99)(	156.57)(	196.86)(	250.72)(	386.59)(	529.80)(

HYDROGRAPH AT	56	155.00	1	5388.	10775.	13469.	16163.	21551.	26939.
		(401.45)		(152.56)(	305.13)(	381.41)(	457.69)(	610.25)(	762.82)(
2 COMBINED	56	441.00	1	7901.	15676.	19596.	23797.	32819.	42051.
		(1142.18)		(223.72)(	443.90)(	554.91)(	673.86)(	929.33)(	1190.76)(
ROUTED TO	6	441.00	1	7901.	15676.	19596.	23797.	32819.	42051.
		(1142.18)		(223.72)(	443.90)(	554.91)(	673.86)(	929.33)(	1190.76)(
2 COMBINED	6	857.00	1	14695.	29264.	36582.	44180.	59996.	76022.
		(2219.62)		(416.11)(	828.67)(	1035.88)(	1251.02)(	1698.89)(	2152.70)(
ROUTED TO	8	857.00	1	12617.	25136.	31434.	38065.	52001.	66109.
		(2219.62)		(357.28)(	711.76)(	890.11)(	1077.87)(	1472.50)(	1872.01)(
HYDROGRAPH AT	7	89.00	1	3532.	7063.	8829.	10595.	14126.	17658.
		(230.51)		(100.00)(	200.00)(	250.00)(	300.00)(	400.00)(	500.01)(
ROUTED TO	8	89.00	1	3307.	6614.	8268.	9921.	13229.	16536.
		(230.51)		(93.65)(	187.30)(	234.12)(	280.95)(	374.59)(	468.24)(
2 COMBINED	8	946.00	1	13268.	26406.	33006.	39859.	54239.	68908.
		(2450.13)		(375.70)(	747.74)(	934.62)(	1128.69)(	1535.89)(	1951.24)(
ROUTED TO	10	946.00	1	12736.	25347.	31684.	38281.	52220.	66372.
		(2450.13)		(360.66)(	717.76)(	897.20)(	1084.01)(	1478.71)(	1879.46)(
HYDROGRAPH AT	9	18.00	1	683.	1365.	1707.	2048.	2731.	3413.
		(46.62)		(19.33)(	38.66)(	48.33)(	57.99)(	77.33)(	96.66)(
ROUTED TO	10	18.00	1	676.	1351.	1689.	2027.	2703.	3379.
		(46.62)		(19.13)(	38.27)(	47.84)(	57.40)(	76.54)(	95.67)(
2 COMBINED	10	964.00	1	12830.	25534.	31918.	38562.	52520.	66747.
		(2496.75)		(363.30)(	723.05)(	903.81)(	1091.94)(	1487.20)(	1890.06)(
ROUTED TO	15	964.00	1	12404.	24687.	30860.	37298.	50823.	64614.
		(2496.75)		(351.25)(	699.05)(	873.86)(	1056.16)(	1439.15)(	1829.67)(
HYDROGRAPH AT	11	183.00	1	23666.	47331.	59164.	70997.	94663.	118328.
		(473.97)		(670.14)(	1340.27)(	1675.34)(	2010.41)(	2680.55)(	3350.69)(
ROUTED TO	11	183.00	1	564.	872.	1078.	1346.	12291.	24065.
		(473.97)		(15.96)(	24.70)(	30.51)(	38.12)(	348.04)(	681.45)(
ROUTED TO	12	183.00	1	563.	865.	1068.	1328.	6994.	14452.
		(473.97)		(15.94)(	24.49)(	30.23)(	37.61)(	198.04)(	409.24)(
HYDROGRAPH AT	12	524.00	1	48102.	96203.	120254.	144305.	192407.	240509.
		(1357.15)		(1362.09)(	2724.18)(	3405.22)(	4086.27)(	5448.36)(	6810.44)(
2 COMBINED	12	707.00	1	48597.	96710.	120770.	144837.	192975.	241115.
		(1831.12)		(1376.12)(	2738.53)(	3419.81)(	4101.34)(	5464.44)(	6827.62)(
ROUTED TO	12	707.00	1	700.	2711.	3000.	5220.	14284.	23751.
		(1831.12)		(19.82)(	76.76)(	84.95)(	147.82)(	404.48)(	672.55)(
ROUTED TO	13	707.00	1	700.	2705.	3000.	5212.	14276.	23707.
		(1831.12)		(19.82)(	76.59)(	84.95)(	147.60)(	404.26)(	671.32)(
HYDROGRAPH AT	13	39.00	1	2214.	4428.	5535.	6642.	8856.	11070.

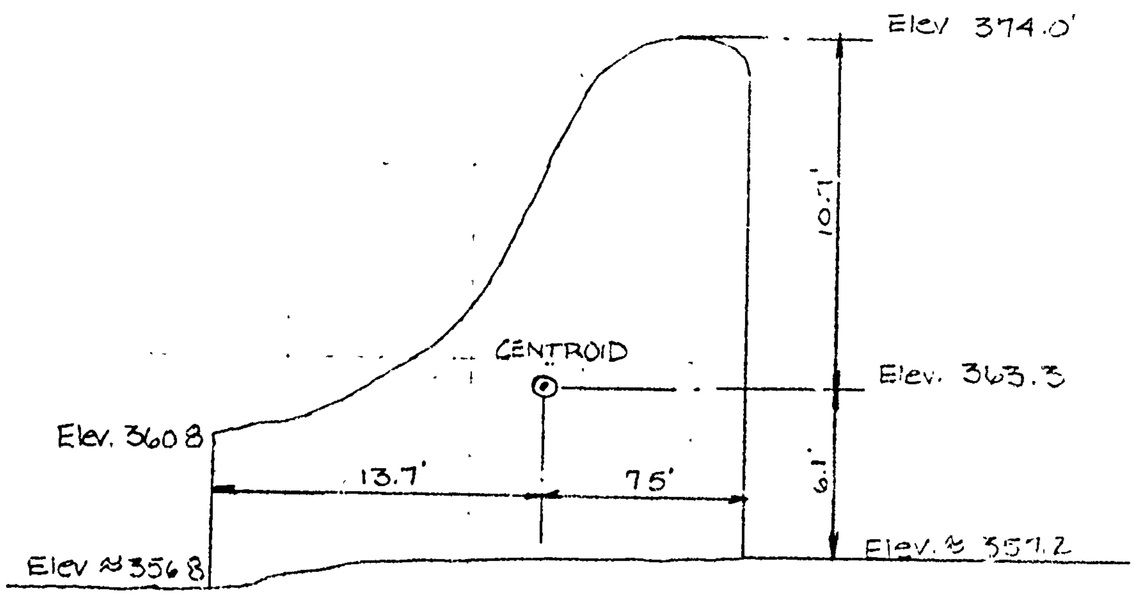
		(101.01)	(	62.69)(	125.39)(	156.74)(	188.08)(	250.78)(	313.47)(
2 COMBINED	13	746.00	1	2914.	5128.	6360.	8266.	15672.	25512.
		(1932.13)	(	82.52)(	145.21)(	180.11)(	234.62)(	443.78)(	722.41)(
ROUTED TO	14	746.00	1	2025.	3886.	5354.	6738.	15192.	24847.
		(1932.13)	(	57.34)(	110.03)(	151.61)(	190.79)(	430.18)(	703.58)(
HYDROGRAPH AT	14	36.00	1	2182.	4364.	5455.	6546.	8728.	10910.
		(93.24)	(	61.79)(	123.57)(	154.47)(	185.36)(	247.15)(	308.94)(
2 COMBINED	14	782.00	1	3689.	6678.	8194.	9825.	15579.	25342.
		(2025.37)	(	104.46)(	189.11)(	232.02)(	278.20)(	441.15)(	717.61)(
HYDROGRAPH AT	14	782.00	1	49040.	98079.	122599.	147119.	196158.	245198.
		(2025.37)	(	1388.65)(	2777.29)(	3471.61)(	4165.94)(	5554.58)(	6943.23)(
2 COMBINED	14	1564.00	1	52189.	103679.	129423.	155166.	206672.	258304.
		(4050.74)	(	1477.83)(	2935.85)(	3664.85)(	4393.86)(	5852.31)(	7314.36)(
ROUTED TO	14	1564.00	1	3400.	8700.	11777.	20620.	37926.	67166.
		(4050.74)	(	96.28)(	246.36)(	333.48)(	583.89)(	1073.94)(	1901.93)(
ROUTED TO	15	1564.00	1	3400.	8700.	11636.	20384.	37673.	65888.
		(4050.74)	(	96.28)(	246.36)(	329.49)(	577.21)(	1066.78)(	1865.75)(
2 COMBINED	15	2528.00	1	15804.	33387.	41208.	54138.	82157.	108878.
		(6547.49)	(	447.53)(	945.41)(	1166.88)(	1533.01)(	2326.44)(	3083.09)(
ROUTED TO	18	2528.00	1	14896.	31591.	38906.	51612.	78794.	106408.
		(6547.49)	(	421.82)(	894.56)(	1101.68)(	1461.50)(	2231.20)(	3013.15)(
HYDROGRAPH AT	16	191.00	1	9966.	19931.	24914.	29897.	39862.	49828.
		(494.69)	(	282.19)(	564.38)(	705.48)(	846.58)(	1128.77)(	1410.96)(
ROUTED TO	18	191.00	1	9363.	18725.	23406.	28088.	37450.	46813.
		(494.69)	(	265.12)(	530.24)(	662.80)(	795.36)(	1060.48)(	1325.59)(
2 COMBINED	18	2719.00	1	14970.	31738.	39099.	51844.	79103.	107170.
		(7042.18)	(	423.90)(	898.73)(	1107.15)(	1468.05)(	2239.94)(	3034.71)(
HYDROGRAPH AT	17	201.00	1	13453.	26906.	33632.	40358.	53811.	67264.
		(520.59)	(	380.94)(	761.88)(	952.35)(	1142.82)(	1523.76)(	1904.70)(
ROUTED TO	17	201.00	1	2812.	4403.	9412.	14557.	23040.	31912.
		(520.59)	(	79.63)(	124.68)(	266.51)(	412.20)(	652.41)(	903.66)(
ROUTED TO	18	201.00	1	2690.	3678.	6664.	9981.	16287.	22844.
		(520.59)	(	76.18)(	104.16)(	188.71)(	282.63)(	461.21)(	646.88)(
2 COMBINED	18	2920.00	1	16994.	35094.	42499.	55244.	82579.	112189.
		(7562.77)	(	481.21)(	993.75)(	1203.42)(	1564.33)(	2338.39)(	3176.83)(
HYDROGRAPH AT	18	19.00	1	797.	1594.	1993.	2391.	3188.	3985.
		(49.21)	(	22.57)(	45.14)(	56.43)(	67.71)(	90.28)(	112.85)(
2 COMBINED	18	2939.00	1	17029.	35162.	42587.	55351.	82728.	112414.
		(7611.98)	(	482.22)(	995.67)(	1205.94)(	1567.35)(	2342.61)(	3183.22)(
ROUTED TO	21	2939.00	1	16550.	34119.	41239.	53792.	81030.	110244.
		(7611.98)	(	468.66)(	966.16)(	1167.75)(	[illegible]3.22)(	2294.52)(	3121.77)(

HYDROGRAPH AT	19	98.00 (253.82)	1	6063. (171.67)	12125. (343.35)	15156. (429.18)	18188. (515.02)	24250. (686.69)	30313. (858.37)
ROUTED TO	21	98.00 (253.82)	1	3527. (99.89)	7055. (199.77)	8819. (249.71)	10582. (299.66)	14110. (399.54)	17637. (499.43)
2 COMBINED	21	3037.00 (7865.79)	1	16608. (470.29)	34229. (969.27)	41382. (1171.82)	53965. (1528.11)	81271. (2301.35)	110560. (3130.72)
HYDROGRAPH AT	20	74.00 (191.66)	1	10683. (302.51)	21366. (605.01)	26707. (756.27)	32049. (907.52)	42732. (1210.03)	53415. (1512.53)
ROUTED TO	20	74.00 (191.66)	1	188. (5.34)	379. (10.74)	484. (13.69)	588. (16.64)	841. (23.80)	1233. (34.92)
ROUTED TO	21	74.00 (191.66)	1	187. (5.29)	376. (10.64)	479. (13.56)	582. (16.48)	824. (23.34)	1207. (34.18)
2 COMBINED	21	3111.00 (8057.45)	1	16782. (475.22)	34575. (979.06)	41825. (1184.36)	54502. (1543.34)	82002. (2322.03)	111610. (3160.45)
HYDROGRAPH AT	21	27.00 (69.93)	1	1805. (51.12)	3611. (102.25)	4514. (127.81)	5416. (153.37)	7222. (204.49)	9027. (255.62)
2 COMBINED	21	3138.00 (8127.38)	1	16807. (475.93)	34623. (980.41)	41888. (1186.13)	54578. (1545.46)	82107. (2325.00)	111748. (3164.34)
ROUTED TO	22	3138.00 (8127.38)	1	16665. (471.90)	34374. (973.36)	41506. (1175.32)	54199. (1534.74)	81546. (2309.13)	111208. (3149.07)
HYDROGRAPH AT	22	98.00 (253.82)	1	8894. (251.86)	17788. (503.71)	22235. (629.64)	26683. (755.57)	35577. (1007.42)	44471. (1259.28)
2 COMBINED	22	3236.00 (8381.20)	1	16705. (473.03)	34454. (975.62)	41606. (1178.14)	54324. (1538.29)	81713. (2313.85)	111438. (3155.57)
ROUTED TO	22	3236.00 (8381.20)	1	16236. (459.75)	33608. (951.67)	41033. (1161.92)	53595. (1517.65)	81106. (2296.60)	109132. (3090.27)

APPENDIX D

STRUCTURAL STABILITY ANALYSIS

LOCKE 24
Stability Analysis



① Determine Weight of Masonry Dam

$$W_c = (\text{Area})(150\ \text{pcf})$$
$$= (204\ \text{sf})(150\ \text{pcf})$$
$$= 30600\ \text{lbs/lin ft}$$
$$= 30.6\ \text{Kips/lin. ft.}$$

② Determine Water Force for Following Conditions

A. Upstream

1. Normal Pool	Elev. 374.0
2. ½ PMF	Elev. 381.45
3. PMF	Elev. 386.95

Locke 24
Stability Analysis

B. Downstream

1. Low Tailwater — Elev. 363.0
2. High Tailwater of Record — Elev. 372.5

A_1. Upstream Normal Pool

$$P_{UNP} = \tfrac{1}{2}\gamma_w h^2$$
$$= \tfrac{1}{2}(62.4)(16.8)^2$$
$$= 8806 \text{ lbs/lin ft}$$
$$= 8.81 \text{ Kips/lin. ft}$$

Resultant Acts 5.6' Above Base

A_2. Upstream ½ PMF

$$P_{U\frac{1}{2}PMF} = \tfrac{1}{2}(62.4)(24.25)^2 - \tfrac{1}{2}(62.4)(7.45)^2$$
$$= 18348 - 1732$$
$$= 16616 \text{ lbs/lin ft.}$$
$$= 16.62 \text{ Kips/lin. ft}$$

Location of Resultant

$$\bar{y}\left[(16.8)(7.45) + \tfrac{1}{2}(16.8)(16.8)\right] = (8.4)(16.8)(7.45) + (5.6)\tfrac{1}{2}(16.8)(16.8)$$
$$\bar{y}\,(125.16 + 141.12) = 1051.34 + 790.27$$
$$\bar{y}\,(266.28) = 1841.61$$
$$\bar{y} = 6.92' \text{ Above Base}$$

Locke 24
Stability Analysis

A_3 Upstream Full PMF

$$P_{UPMF} = (1/2)(62.4)(29.75)^2 - (1/2)(62.4)(12.95)^2$$
$$= 27614 - 5232$$
$$= 22382 \text{ lbs./lin. ft.}$$
$$= 22.38 \text{ Kips/lin ft.}$$

Location of Resultant

$$\bar{y}\left[(16.8)(12.95) + 1/2(16.8)(16.8)\right] = (8.4)(16.8)(12.95) + (5.6)(1/2)(16.8)(16.8)$$
$$\bar{y}(217.56 + 141.12) = 1827.50 + 790.27$$
$$\bar{y}(358.68) = 2617.77$$
$$\bar{y} = 7.30' \text{ Above Base}$$

B_1 Downstream Low Tailwater

$$P_{DLT} = 1/2(62.4)(6.20)^2$$
$$= 1199 \text{ lbs./lin. ft}$$
$$= 1.20 \text{ Kips/lin ft}$$

Resultant Acts 2.07' Above Base

B_2 Downstream High Tailwater

$$P_{DHT} = 1/2(62.4)(15.7)^2$$
$$= 7690 \text{ lbs./lin. ft.}$$
$$= 7.69 \text{ Kips/lin ft.}$$

Resultant Acts 5.23' Above Base

(3.) Determine Ice Load

$$P_{I_{MAX}} = \frac{(5000\,psf)(2'\,deep)}{1000}$$

$$= 10\ Kips/lin\ ft.$$

Resultant Acts 15.8' Above Base

(4.) Determine Upstream Siltation Force

Assume Siltation to Elev. 366 (Gate Crest)

$$P_s\ \ 1/2\,(85\,psf)(366.0 - 357.2)^2$$

$$= 3291.2\ lbs/lin.\ ft.$$

$$= 3.29\ Kips/lin\ ft$$

Resultant Acts 2.93' Above Base

(5.) Determine Hydrodynamic Pressure, Force, and Moment

$$P_e = c\lambda\gamma_w\sqrt{zh}$$

for $z/h = 1$ $\quad c = .73$

for zone 2 $\quad \lambda = .05$

$$P_e = \frac{(.73)(.05)(62.4)(16.8)}{1000} = .0383\ Ksf/lin\ ft$$

(for Normal Pool)

Locke 24
Stability Analysis

$V_e = .726\ P_e\ Z$
$= (.726)(.0383)(16.8)$
$= .47$ Kips/lin. ft.
(for Normal Pool)

$M_e = .299\ P_e\ Z^2$
$= (.299)(.0383)(16.8)^2$
$= 3.23$ Kip-ft/lin.ft
(for Normal Pool)

For 1/2 PMF:

$P_e = \dfrac{(.73)(.05)(62.4)(24.25)}{1000} = .0552$ ksf/lin. ft.

$V_e = (.726)(.0552)(24.25) = .97$ Kips/lin ft

$M_e = (.299)(.0552)(24.25)^2 = 9.71$ Kip-ft/lin ft

For Full PMF:

$P_e = \dfrac{(.73)(.05)(62.4)(29.75)}{1000} = .0678$ ksf/lin ft.

$V_e = (.726)(.0678)(29.75) = 1.46$ Kips/lin. ft.

$M_e = (.299)(.0678)(29.75)^2 = 17.94$ Kip-ft/lin. ft.

Locke 24
Stability Analysis

(6.) Determine Inertia Force Due to Seismic

$$P_c = \lambda W_c$$
$$= (.05)(30.6)$$
$$= 1.53 \text{ Kips / lin.ft.}$$

Resultant Acts Through Centroid, 6.1' Above Base

(7.) Determine Full and 1/2 Uplift Pressures at Normal Pool, 1/2 PMF, and Full PMF

At Normal Pool:

$$P_{u_{Full}} = (62.4)(21.2)(365 - 356.8) + 1/2(62.4)(21.2)\left[(374 - 357.2) - (365 - 356.8)\right]$$
$$= 10847 + 5688$$
$$= 16535 \text{ lbs/ lin.ft.}$$
$$= 16.54 \text{ Kips / lin ft.}$$

$$\bar{X}(10847 + 5688) = (10.6)(10847) + (14.1)(5688)$$
$$\bar{X}\ 16535 = 195179$$
$$\bar{X} = 11.8' \text{ From Toe}$$

At 1/2 PMF:

$$P_{u_{Full}} = (62.4)(21.2)(372.5 - 356.8) + 1/2(62.4)(21.2)\left[24.25 - (372.5 - 356.8)\right]$$
$$= 20769 + 5655$$
$$= 26424 \text{ lbs/ lin. ft}$$
$$= 26.42 \text{ Kips / lin ft}$$

Locke 24
Stability Analysis

$P_{u_{1/2}} = 13.21$ Kips / lin ft.

$\bar{X}\,(20769 + 5655) = (10.6)(20769) + (14.1)(5655)$

$\bar{X}\,26424 = 299887$

$\bar{X} = 11.35'$ From Toe

At Full PMF:

$P_{u_{Full}} = 20769 + 1/2\,(62.4)(21.2)(29.75 - 15.7)$

$= 20769 + 9293$

$= 30062$ lbs./lin.ft

$= 30.06$ Kips / lin. ft

$P_{u_{1/2}} = 15.03$ Kips / lin.ft.

$\bar{X}\,(20769 + 9293) = (10.6)(20769) + (14.1)(9293)$

$\bar{X}\,30062 = 351183$

$\bar{X} = 11.68'$ From Toe

Locke 24
Stability Analysis

FORCE and MOMENT

LOADING		FORCE (Kips)	MOMENT ARM (FT.)	MOMENT ABOUT TOE (Kip-Ft)
Weight of Dam	W_c	30.6	13.7	+419.22
Water Forces				
Downstream				
Low	P_{DLT}	1.20	2.07	+2.48
High	P_{DHT}	7.69	5.23	+40.22
Upstream				
Normal	P_{UNP}	8.81	-5.6	-49.34
½ PMF	$P_{u ½ PMF}$	16.62	-6.92	-115.01
PMF	P_{uPMF}	22.38	-7.30	-163.37
Ice	P_{IMAX}	10.0	-15.8	-158.00
Silt	P_s	3.29	-2.93	-9.64
Hydrodynamic Loading (V_e, M_e)				
Normal		.47	-6.87	-3.23
½ PMF		.97	-10.01	-9.71
PMF		1.46	-12.29	-17.94
Seismic Inertia Force	P_e	1.53	-6.1	-9.33
Hydrostatic Uplift	(P_u)			
Normal Pool				
Full Uplift		16.54	-11.8	-195.17
½ Uplift		8.27	-11.8	-97.59
½ PMF				
Full Uplift		26.42	-11.35	-299.87
½ Uplift		13.21	-11.35	-149.93
PMF				
Full Uplift		30.06	-11.68	-351.10
½ Uplift		15.03	-11.68	-175.55

Locke 24
Stability Analysis

STABILITY CALCULATIONS

(1.) Normal Pool, 1/2 Uplift, No Ice, No Seismic

A. OVERTURNING STABILITY

Resisting Moments = 419.22 + 2.48 = 421.7

Overturning Moments = -49.34 - 9.64 - 97.59 = 156.57

$$F.S. = \frac{421.70}{156.57} = 2.69 \text{ (with respert to overturning)}$$

$$\bar{x} = \frac{421.7 - 156.27}{30.6 - 8.27} = 11.87$$

$$e = B/2 - \bar{x} = \frac{21.2}{2} - 11.87 = -1.27$$

$$B/6 = \frac{21.6}{6} = 3.53 > 1.27 \text{ (Resultant within Middle 1/3)}$$

B. SLIDING STABILITY

$$F.S. = \frac{(W_c - P_u)\tan\phi}{\Sigma F_{horizontal}}$$

$$= \frac{30.6 - 8.27 \tan 35^\circ}{1.20 - 8.81 - 3.29} = \frac{(22.33)(.70)}{10.9}$$

$$= 1.43$$

(2.) Normal Pool, Full Uplift, No Ice, No Siesmic

A. OVERTURNING

Resisting Moments = 419.22 + 2.48 = 421.7

Overning Moments = -49.34 - 9.64 - 195.17 = 254.15

$$FS. = \frac{421.7}{254.15} = 1.66$$

Locke 24
Stability Analysis

$$\bar{X} = \frac{421.7 - 254.15}{30.6 - 16.54} = 11.92$$

$e = 10.6 - 11.92 = 1.32 < 3.53$ (Resultant within Middle 1/3)

B. SLIDING

$$F.S. = \frac{(30.6 - 16.54)(.70)}{1.20 - 8.81 - 3.29} = .90$$

(3.) Normal Pool, 1/2 PMF, Ice, No Seismic

A. OVERTURNING

Resisting Moments: $419.22 + 2.48 = 421.7$

Overturning Moments: $-49.34 - 158.0 - 9.64 - 97.59 = 314.57$

$$F.S. = \frac{421.7}{314.57} = 1.34$$

$$\bar{X} = \frac{421.7 - 314.57}{30.6 - 8.27} = 4.80$$

$e = 10.6 - 4.80 = 5.8 > 3.53$ (Resultant outside Middle 1/3)

B. SLIDING

$$F.S. = \frac{(30.6 - 8.27)(.70)}{1.20 - 8.81 - 10.0 - 3.29} = .75$$

(4.) Normal Pool, Full Uplift, Ice, No Seismic

A. OVERTURNING

Resisting Moments $= 419.22 + 2.48 = 421.7$

Overturning Moments $= -49.34 - 158.0 - 9.64 - 195.17 = 412.15$

Locke 24
Stability Analysis

$$F.S. = \frac{421.7}{412.15} = 1.02$$

$$\bar{X} = \frac{421.7 - 412.15}{30.6 - 16.54} = .68$$

$e = 1.06 - 6.8 = 9.92 > 3.53$ (Resultant outside Middle 1/3)

B. SLIDING

$$F.S. = \frac{(30.6 - 16.54)(.70)}{1.20 - 8.81 - 10.0 - 3.29} = .47$$

(5) Normal Pool, 1/2 Uplift, Ice, Seismic

A. OVERTURNING

Resisting Moments $= 419.22 + 2.48 = 421.7$

Overturning Moments $= -49.34 - 158.0 - 9.64 - 3.23 - 9.33 - 97.59$
$= 327.13$

$$F.S. = \frac{421.7}{327.13} = 1.29$$

$$\bar{X} = \frac{421.7 - 327.13}{30.6 - 8.27} = 4.24$$

$e = 10.6 - 4.24 = 6.36 > 3.53$ (Resultant outside Middle 1/3)

B. SLIDING

$$F.S. = \frac{(30.6 - 8.27)(.70)}{1.20 - 8.81 - 10.0 - 3.29 - .47 - 1.53} = .68$$

Locke 24
Stability Analysis

(6) Normal Pool, Full Uplift, Ice, Seismic

A. OVERTURNING

Resisting Moments = 419.22 + 2.48 = 421.7

Overturning Moments = -49.34 - 158.0 - 9.64 - 3.23 - 9.33 - 195.17 = 424.71

$$F.S = \frac{421.7}{424.71} = .99$$

$$\bar{X} = \frac{421.7 - 424.71}{30.6 - 16.54} = -.21$$

e = 10.6 + .21 = 10.81 (Resultant outside Base)

B. SLIDING

$$F.S. = \frac{(30.6 - 16.54)(.70)}{1.20 - 8.81 - 10.0 - 3.29 - .47 - 1.53} = .43$$

(7.) 1/2 PMF, 1/2 Uplift, No Ice, No Seismic

A. OVERTURNING

Resisting Moments = 419.22 + 40.22 = 459.44

Overturning Moments = -115.01 - 9.64 - 149.93 = 274.58

$$F.S. = \frac{459.44}{274.58} = 1.67$$

$$\bar{X} = \frac{459.44 - 274.58}{30.6 - 13.21} = 10.63$$

e = 10.6 - 10.63 = -.03 < 3.53 (Resultant Middle 1/3)

Locke 24
Stability Analysis

B. SLIDING

$$F.S. = \frac{(30.6-13.21)(.70)}{7.69-16.62-3.29} = 1.0$$

⑧ ½ PMF, ½ Uplift, No Ice, Seismic

A. OVERTURNING

Resisting Moments = 419.22 + 40.22 = 459.44

Overturning Moments = -115.01 - 9.64 - 9.71 - 9.33 - 149.93 = 293.62

$$F.S. = \frac{459.44}{293.62} = 1.56$$

$$\bar{X} = \frac{459.44-293.62}{30.6-13.21} = 9.54$$

$e = 10.6 - 9.54 = 1.06 < 3.53$ (Resultant Middle ⅓)

B. SLIDING

$$F.S. = \frac{(30.6-13.21)(.70)}{7.69-16.62-3.29-.97-1.53} = .83$$

⑨ PMF, ½ Uplift, No Ice, No Seismic

A. OVERTURNING

Resisting Moments = 419.22 + 40.22 = 459.44

Overturning Moments = -163.37 - 9.64 - 175.55 = 348.56

$$F.S. = \frac{459.44}{348.56} = 1.32$$

$$\bar{X} = \frac{459.44-348.56}{30.6-15.03} = 7.12$$

$e = 10.6 - 7.12 = 3.48 < 3.53$ (Resultant Middle 1/3)

B. SLIDING

$$F.S. = \frac{(30.6 - 15.03)(.70)}{7.69 - 22.38 - 3.29} = .61$$

(10) PMF, 1/2 Uplift, No Ice, Seismic

A OVERTURNING

Resisting Moments = 419.22 + 40.22 = 459.44

Overturnig Moments = -163.37 - 9.64 - 17.94 - 9.33 - 175.55 = 375.83

$$F.S. = \frac{459.44}{375.83} = 1.22$$

$$\bar{X} = \frac{(459.44 - 375.83)(.70)}{30.6 - 15.03} = 5.37$$

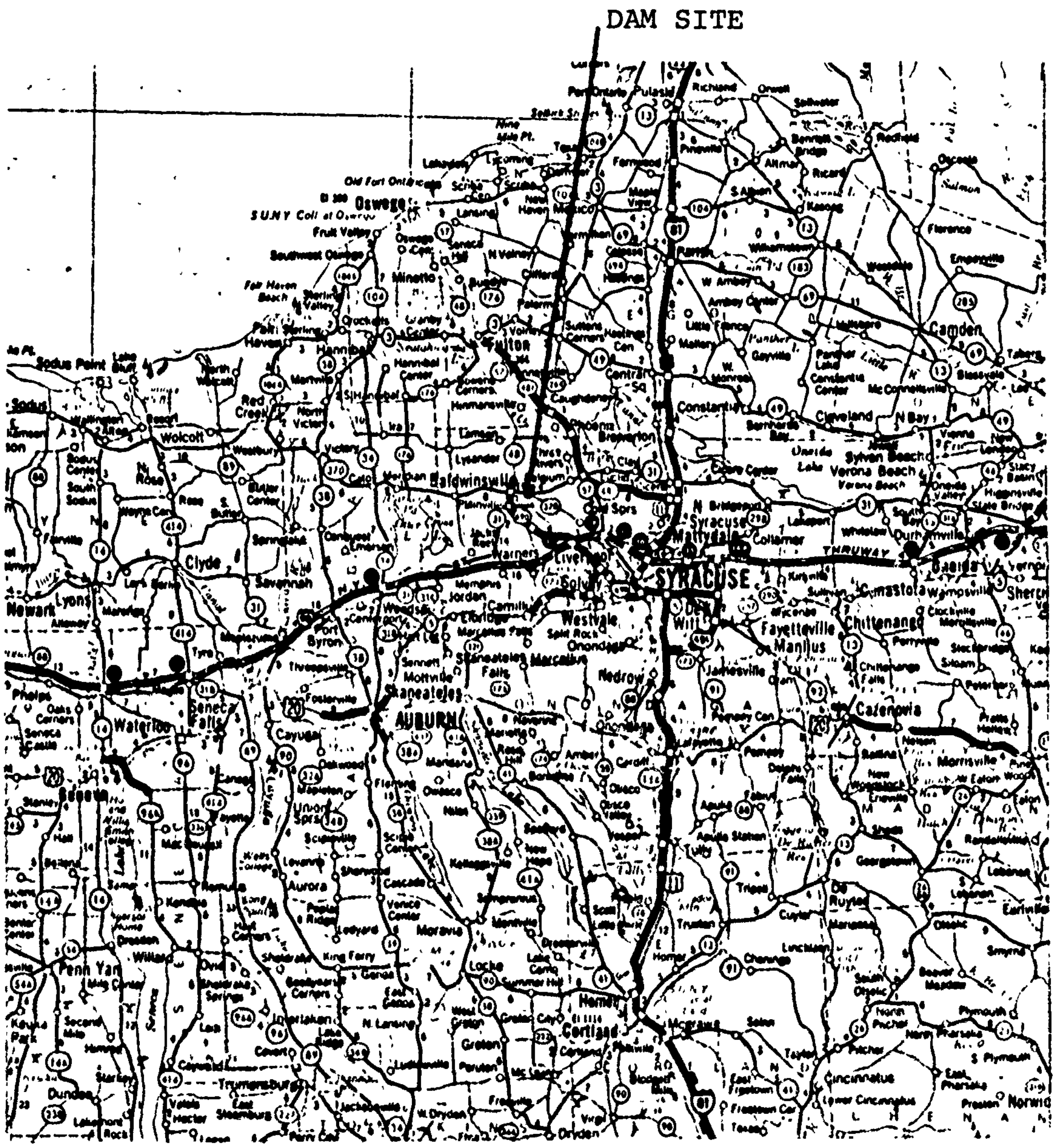
$e = 10.6 - 5.37 = 5.23 > 3.53$ (Resultant outside Middle 1/3)

B. SLIDING

$$F.S. = \frac{(30.6 - 15.03 (.70)}{7.69 - 22.38 - 3.29 - 1.46 - 1.53} = .52$$

APPENDIX E

DRAWINGS

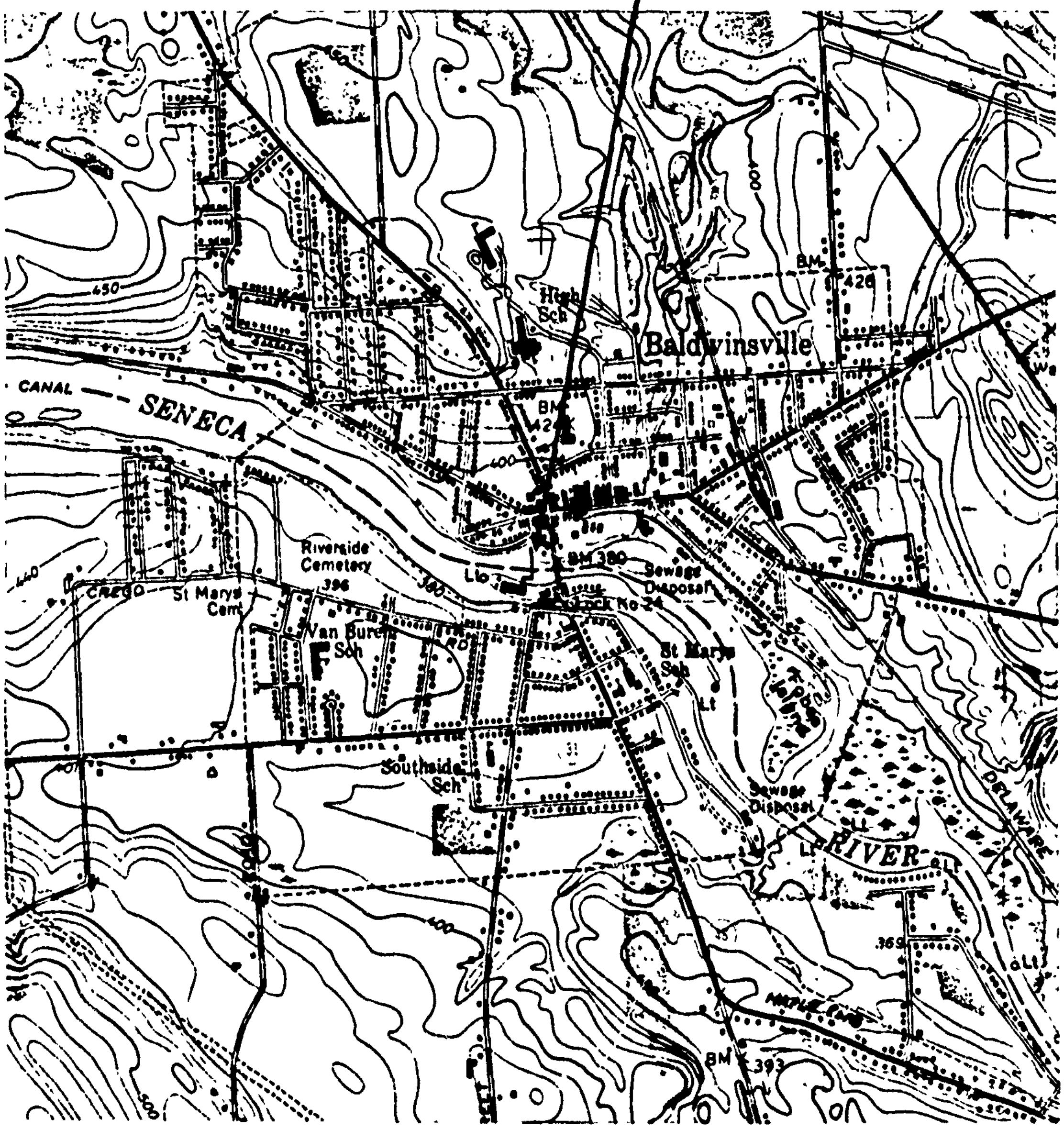


VICINITY MAP

LOCK 24 ERIE CANAL

I.D. NO. N.Y. 792

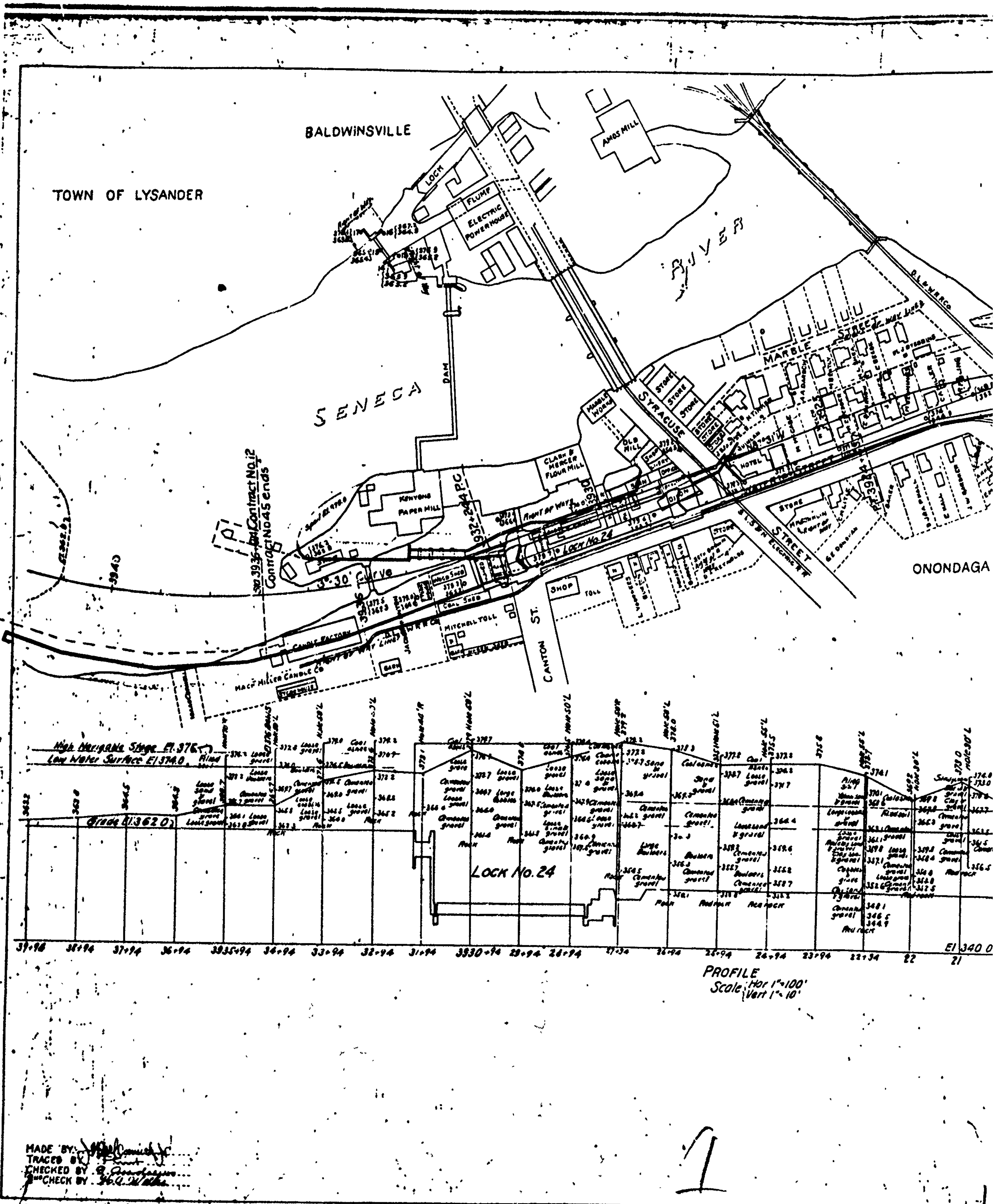
DAM SITE

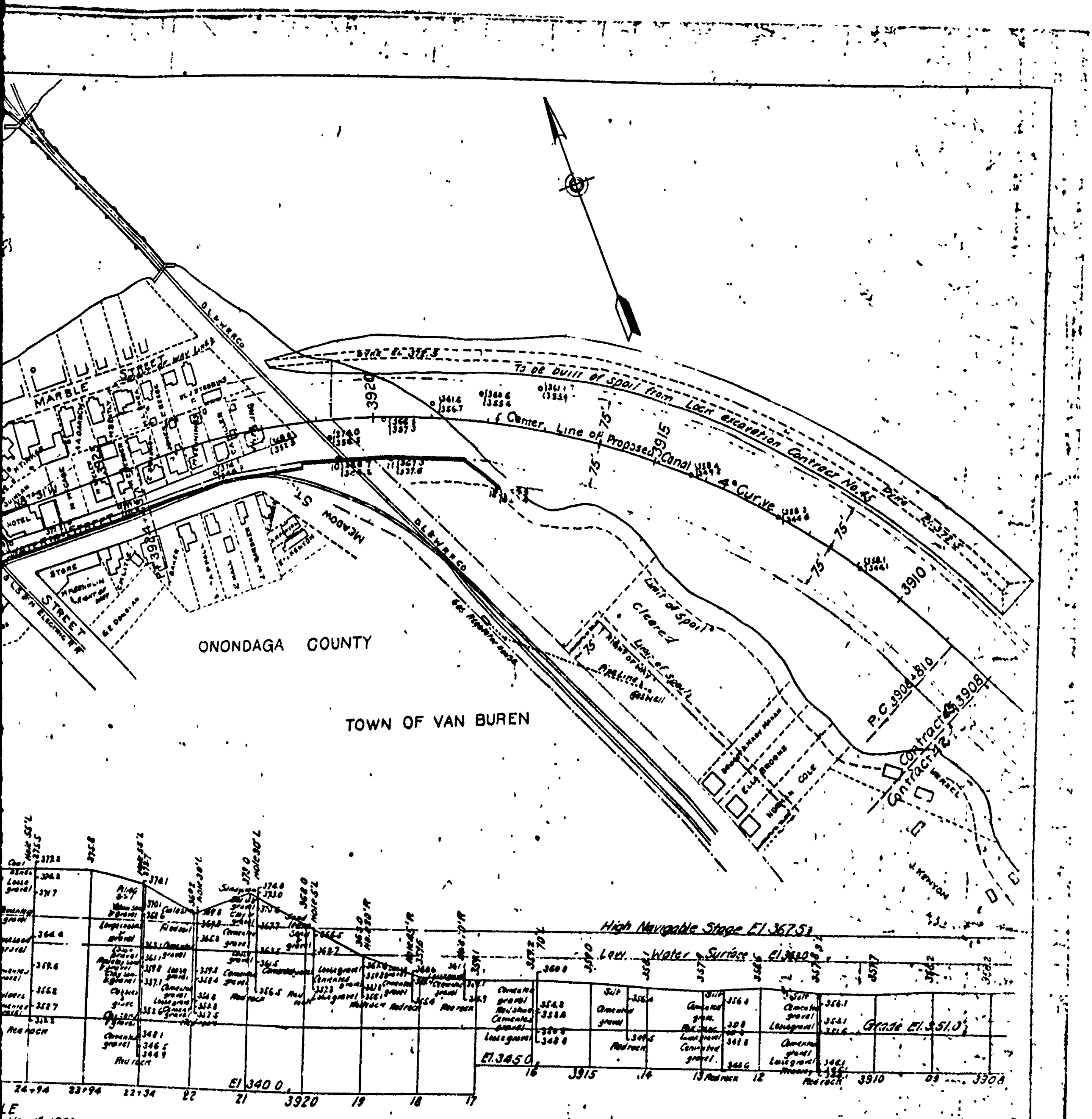


TOPOGRAPHIC MAP

LOCK 24 ERIE CANAL

I.D. NO. N.Y. 792


BALDWINSVILLE
TOWN OF LYSANDER
SENECA
RIVER
ONONDAGA
LOCK
FLUME
ELECTRIC POWERHOUSE
AMOS MILL
DAM
KENYONS PAPER MILL
CLARK & MERCER FLOUR MILL
MARBLE WORKS
OLD MILL
STORE
HOTEL
SHOP
MARBLE STREET
SYRACUSE STREET
CANTON ST.
CANDLE FACTORY
MACK MILLER CANDLE CO.
MITCHELL TOLL
COAL SHED
RIGHT OF WAY
LOCK No. 24
3°-30' Curve
Contract No. 45 ends
High Navigable Stage El. 376
Low Water Surface El. 374.0
Grade El. 362.0
Lock No. 24
El. 340.0
PROFILE
Scale Hor 1"=100' Vert 1"=10'
MADE BY
TRACED BY
CHECKED BY
2ND CHECK BY
1



Contract No. 45.

Erie Canal — Section 6.

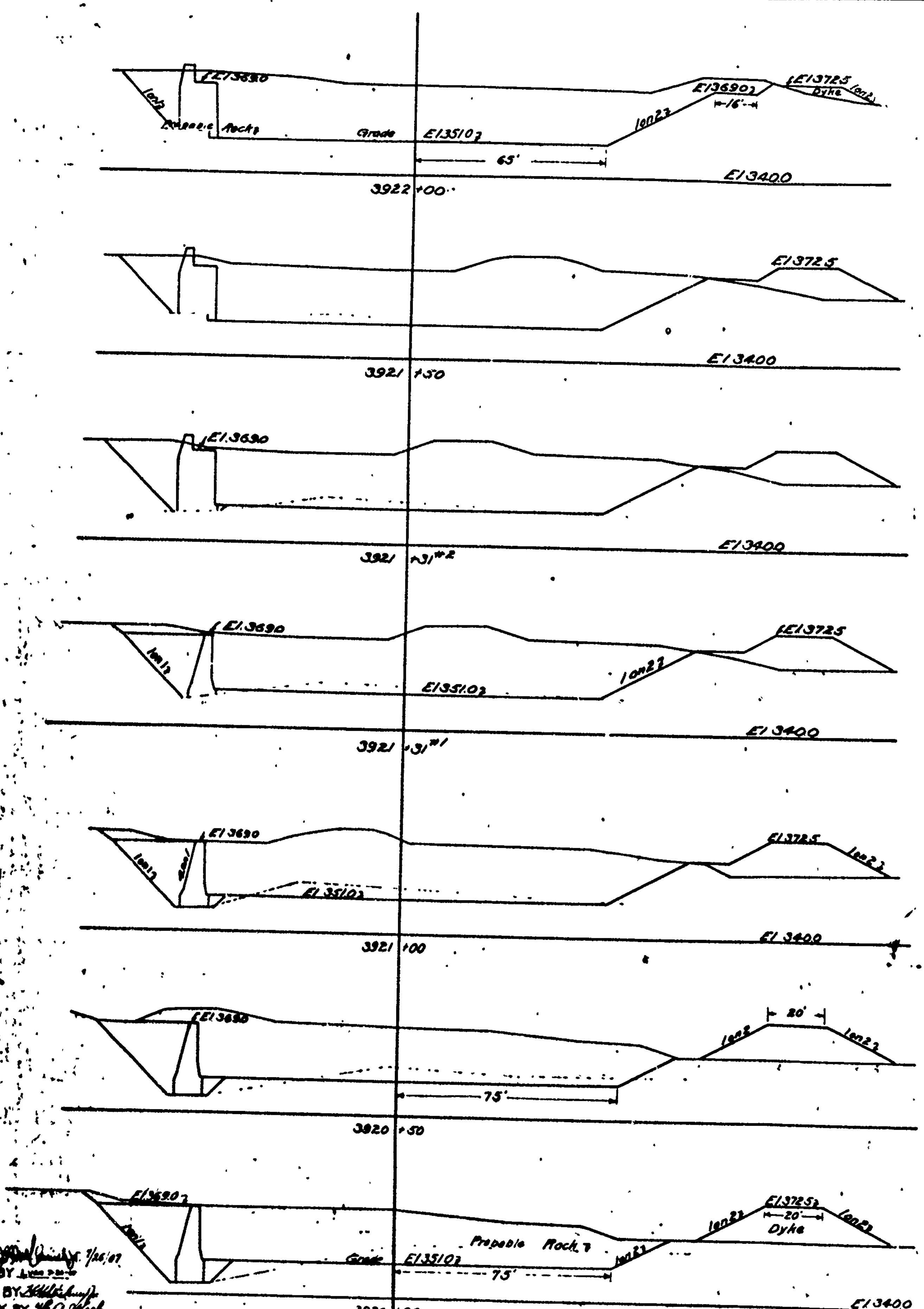
For the construction of a dam in the Oneida River at Caughdenoy and of Lock No. 24 and appertaining structures at Baldwinsville

PLAN & PROFILE OF LOCK NO. 24 & APPROACHES

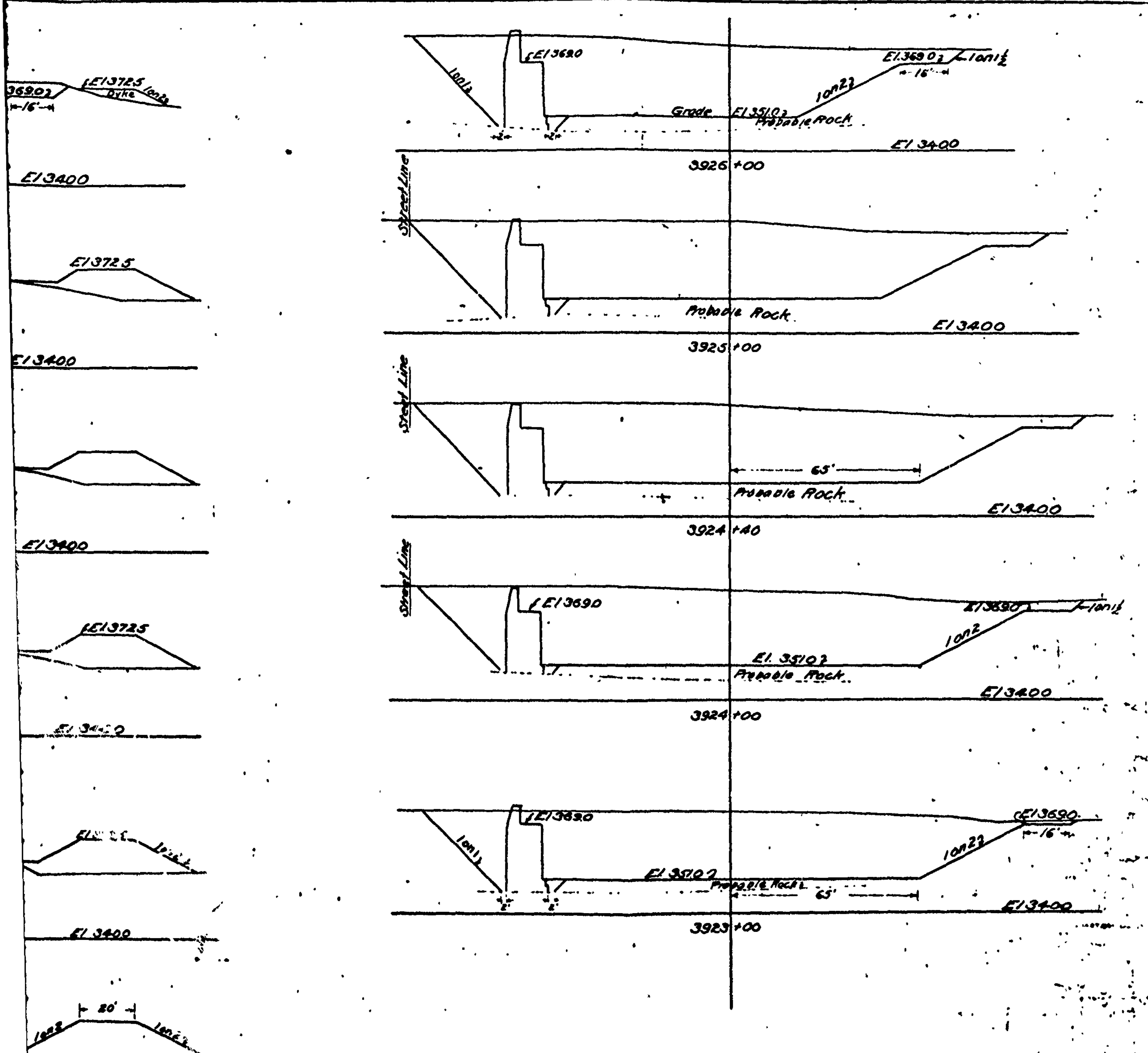
Scales: Hor. 100 feet to the inch
Vert. 10

Examined and approved
G. F. Stickney
Nov. 27 1907

Examined and approved
W. R. Hill
Jan. 22



MADE BY [illegible] 7/26/07
TRACED BY [illegible]
CHECKED BY [illegible]
2nd CHECK BY [illegible]



Contract No. 45.

Erie Canal **Section 6**

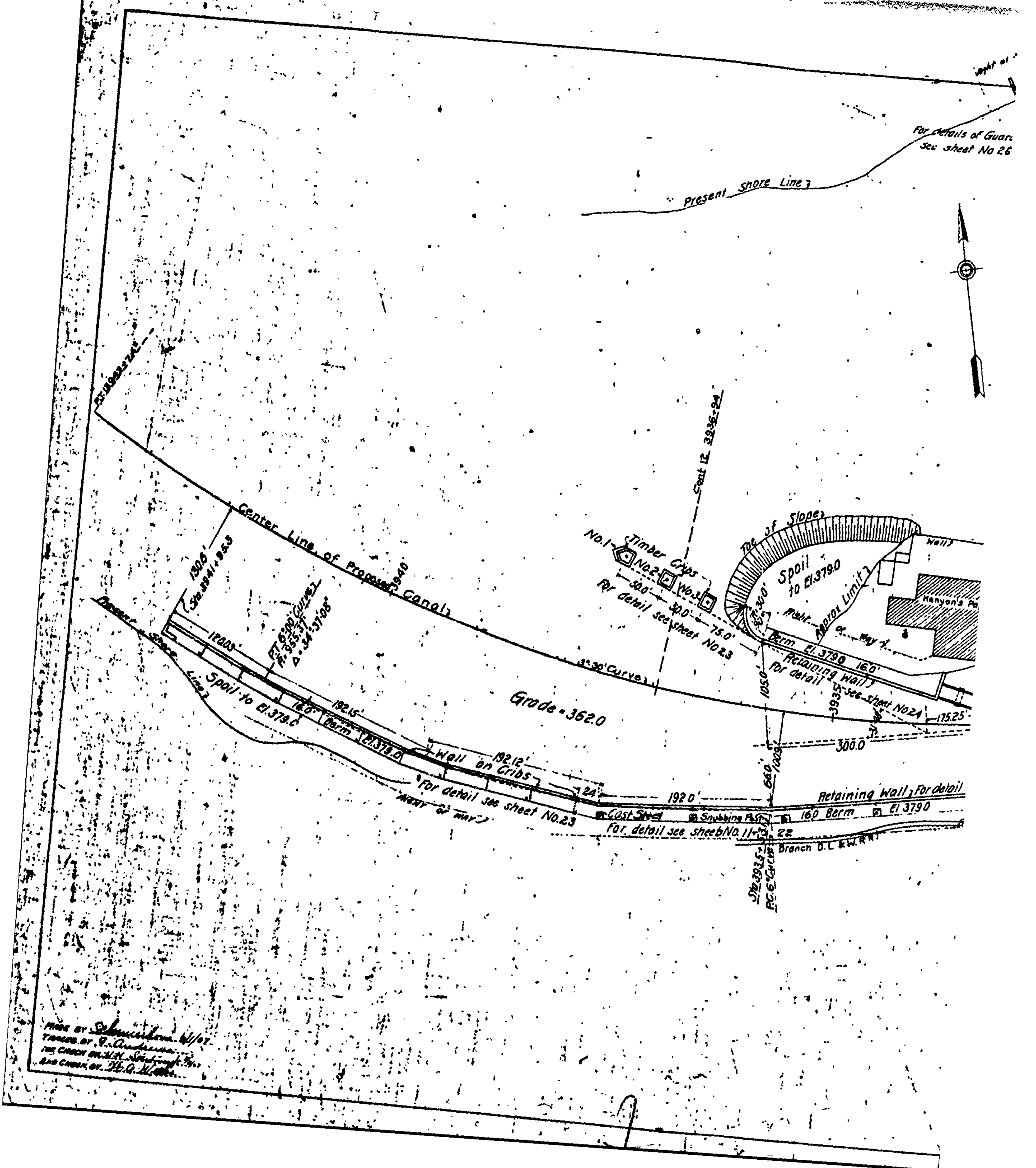
For the construction of a dam in the Oneida River at Oaughdenoy and of Lock No. 24 and appertaining structures at Baldwinsville

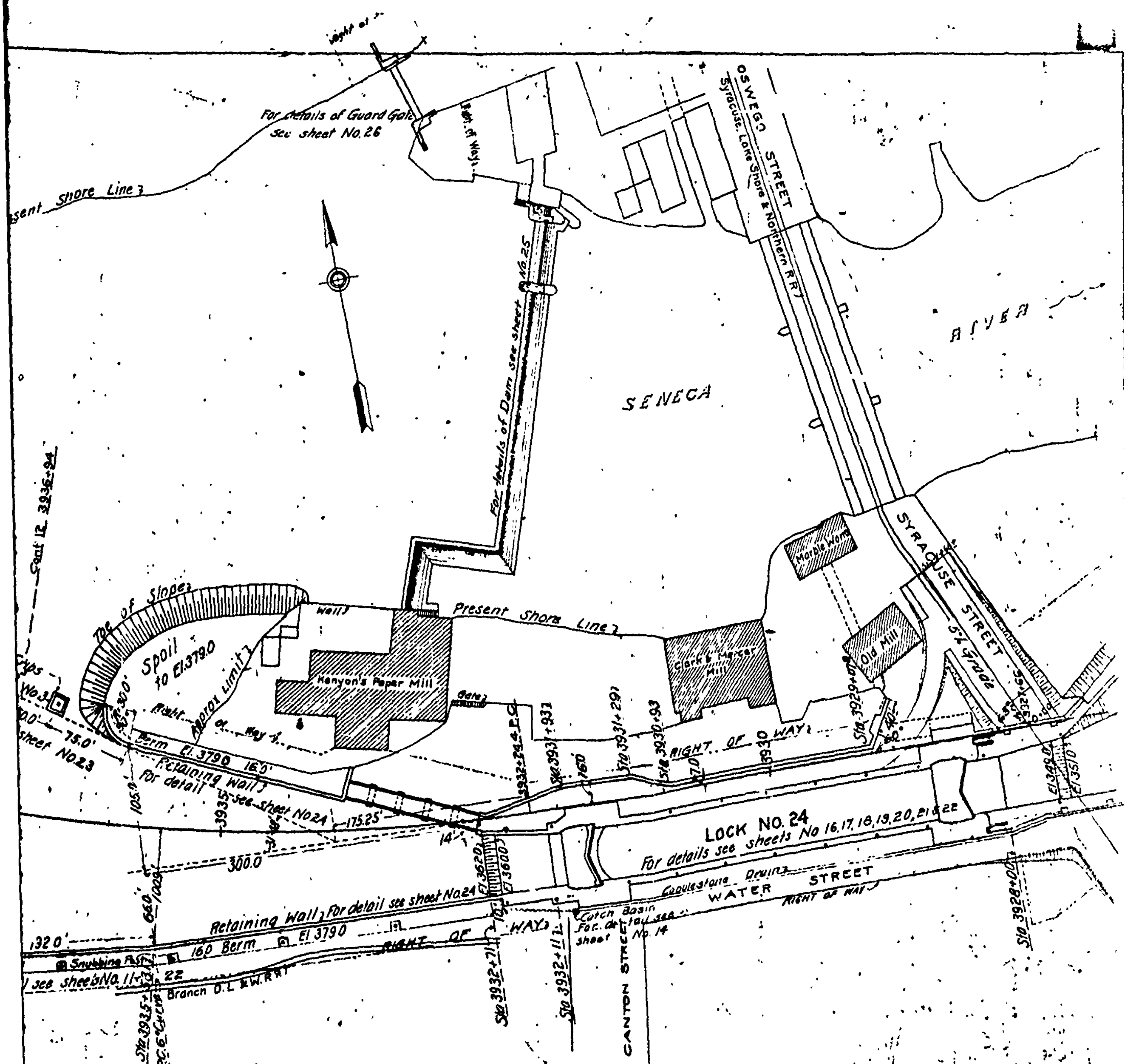
CROSS SECTIONS OF LOWER APPROACH TO LOCK NO. 24, STA. 3920+00 TO STA. 3926+00

Scale: 20 feet to the inch

Examined and approved
G. F. Stickney
Expert Lock Designer
Nov. 27. 1907

Examined and approved
[illegible]
Special Deputy State Engineer
Nov. 27 1907


For details of Guard
See sheet No 26
Present Shore Line
Center Line of Proposed Canal
Conn. 12 3936+94
Timber Cribs
No.1
No.2
No.3
For detail see sheet No 23
Toe of Slope
Spoil to El.379.0
Approx Limit
Right of Way
Kenyon's
Berm El 379.0 16.0'
Retaining Wall
For detail see sheet No 24
3°30' Curve
Grade = 362.0
Present Shore Line
Spoil to El.379.0
16.0' Berm El.379.0
Wall on Cribs
For detail see sheet No.23
Right of Way
Retaining Wall. For detail
16.0 Berm El 379.0
Cast Steel
Snubbing Post
For detail see sheet No. 11
Branch D.L.&W.R.R.
P.T. 6°00' Curve
Sta.3941+95.3
130.6'
120.03'
192.15'
192.12'
192.0'
300.0
175.25'
105.0'
75.0'
30.0'
Made by
Traced by
1st Check by
2nd Check by



Contract No. 45.

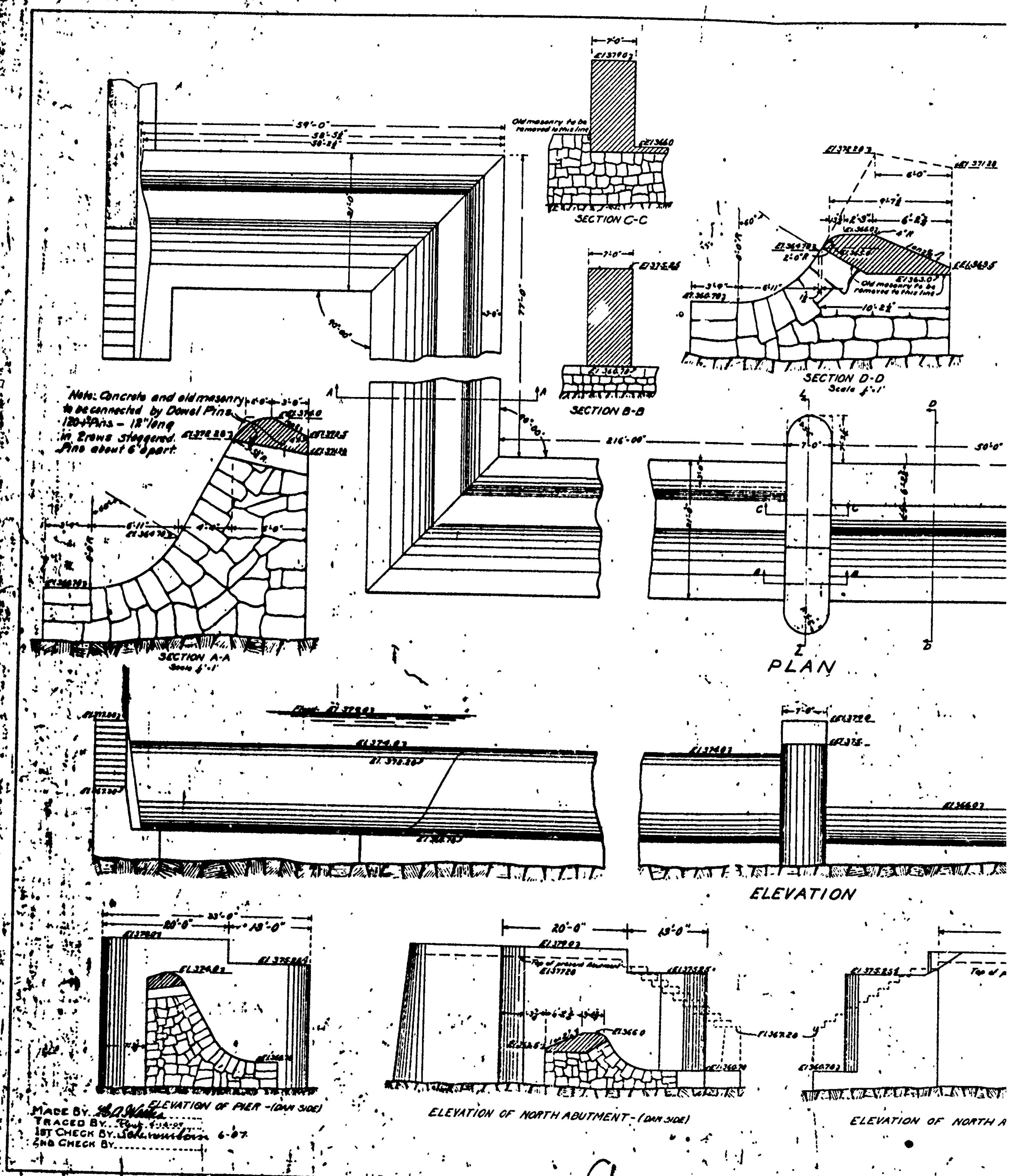
Erie Canal **Section 6.**

For the construction of a dam in the Oneida River at Oaughdenoy and of Lock No. 24 and appertaining structures at Baldwinsville

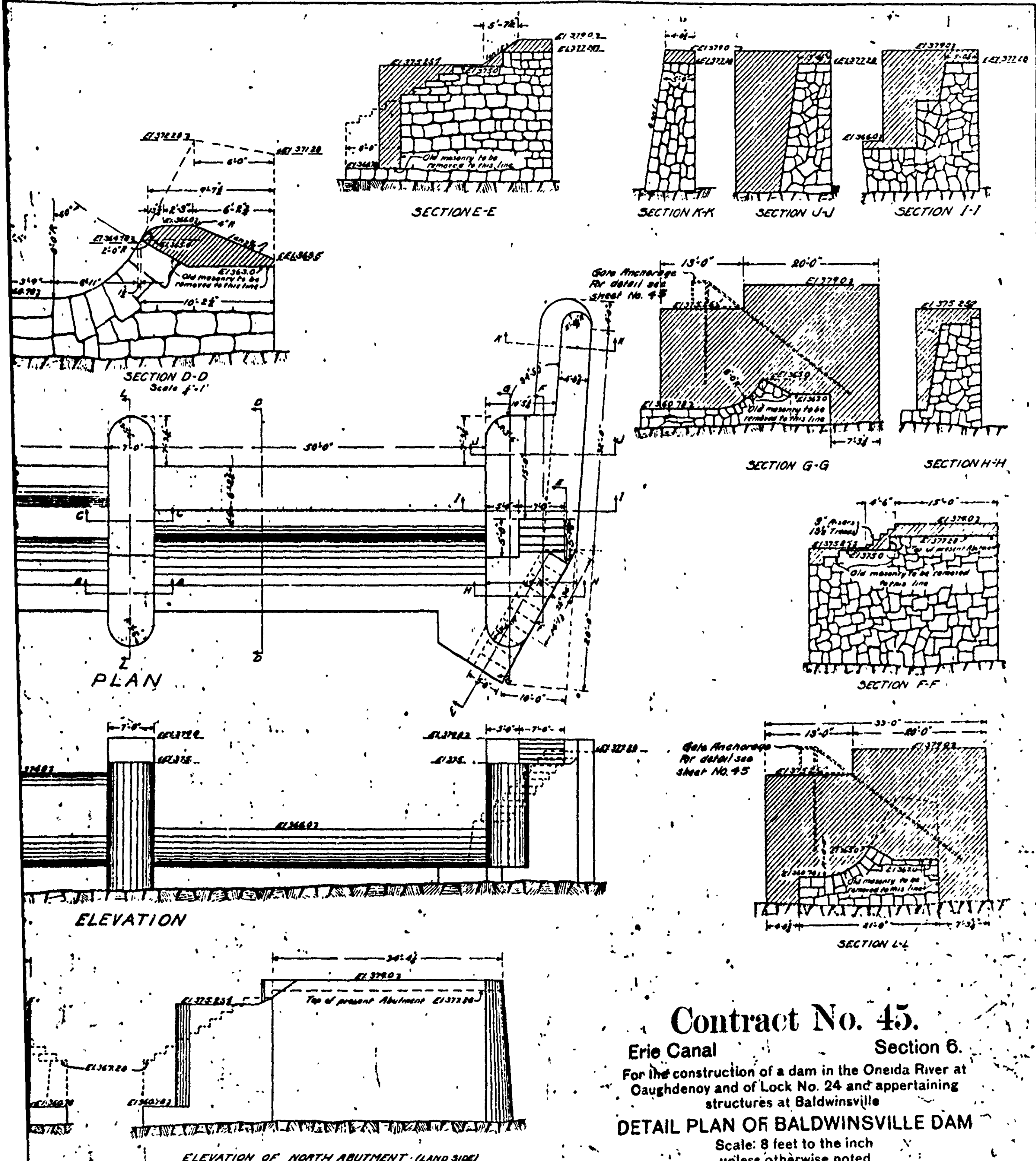
DETAILED LOCATION PLAN OF UPPER APPROACH TO LOCK NO. 24

Scale: 50 feet to the inch

Examined and approved	Examined and approved
G. F. Stickney	[illegible]
Expert Lock Designer	Special Deputy State Engineer
Nov. 27. 1907	Jan 22



SECTION C-C
Old masonry to be removed to this line
SECTION B-B
SECTION D-D
Scale 1/4"-1'
Old masonry to be removed to this line
Note: Concrete and old masonry to be connected by Dowel Pins. 120 Pins - 18" long in 2 rows staggered. Pins about 6" apart.
SECTION A-A
Scale 1/4"-1'
PLAN
ELEVATION
ELEVATION OF PIER - (DAN SIDE)
ELEVATION OF NORTH ABUTMENT - (DAN SIDE)
ELEVATION OF NORTH A
Top of present Abutment
MADE BY
TRACED BY
1ST CHECK BY
2ND CHECK BY



Contract No. 45.

Erie Canal **Section 6.**

For the construction of a dam in the Oneida River at Oaughdenoy and of Lock No. 24 and appertaining structures at Baldwinsville

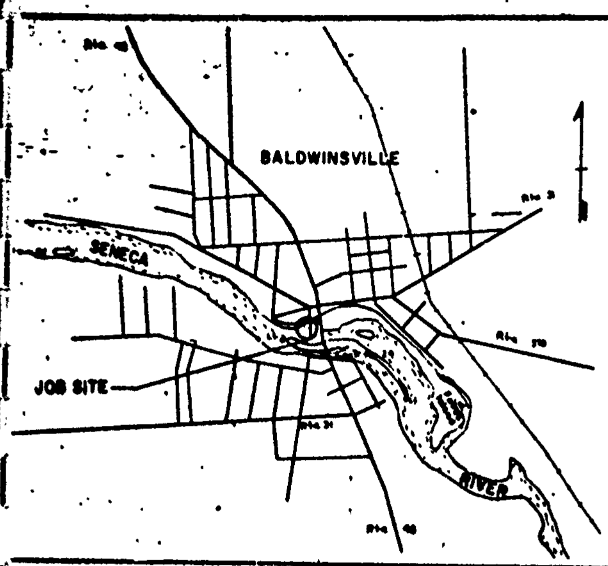
DETAIL PLAN OF BALDWINSVILLE DAM

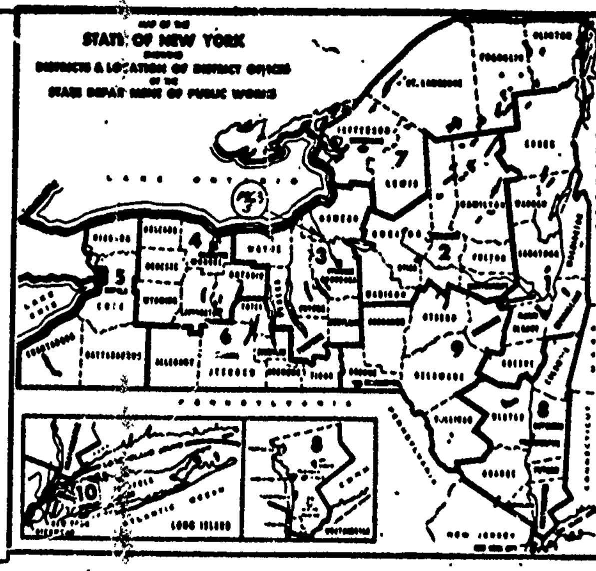
Scale: 8 feet to the inch unless otherwise noted

Examined and approved
G. F. Stickney
Expert Lock Designer
Nov 27 1907

Examined and approved
W. Hill
Special Deputy State Engineer
Jan 22 190?

25


BALDWINSVILLE
SENECA
RIVER
JOB SITE


STATE OF NEW YORK

STATE OF NEW YORK
DEPARTMENT OF PUBLIC WORKS
DIVISION OF CONSTRUCTION
CHAPTER 542, LAWS OF 1939

CONTRACT M63-5

FOR

RECONSTRUCTION OF TAINTOR GATE
BALDWINSVILLE DAM
BALDWINSVILLE

ONONDAGA COUNTY
NEW YORK

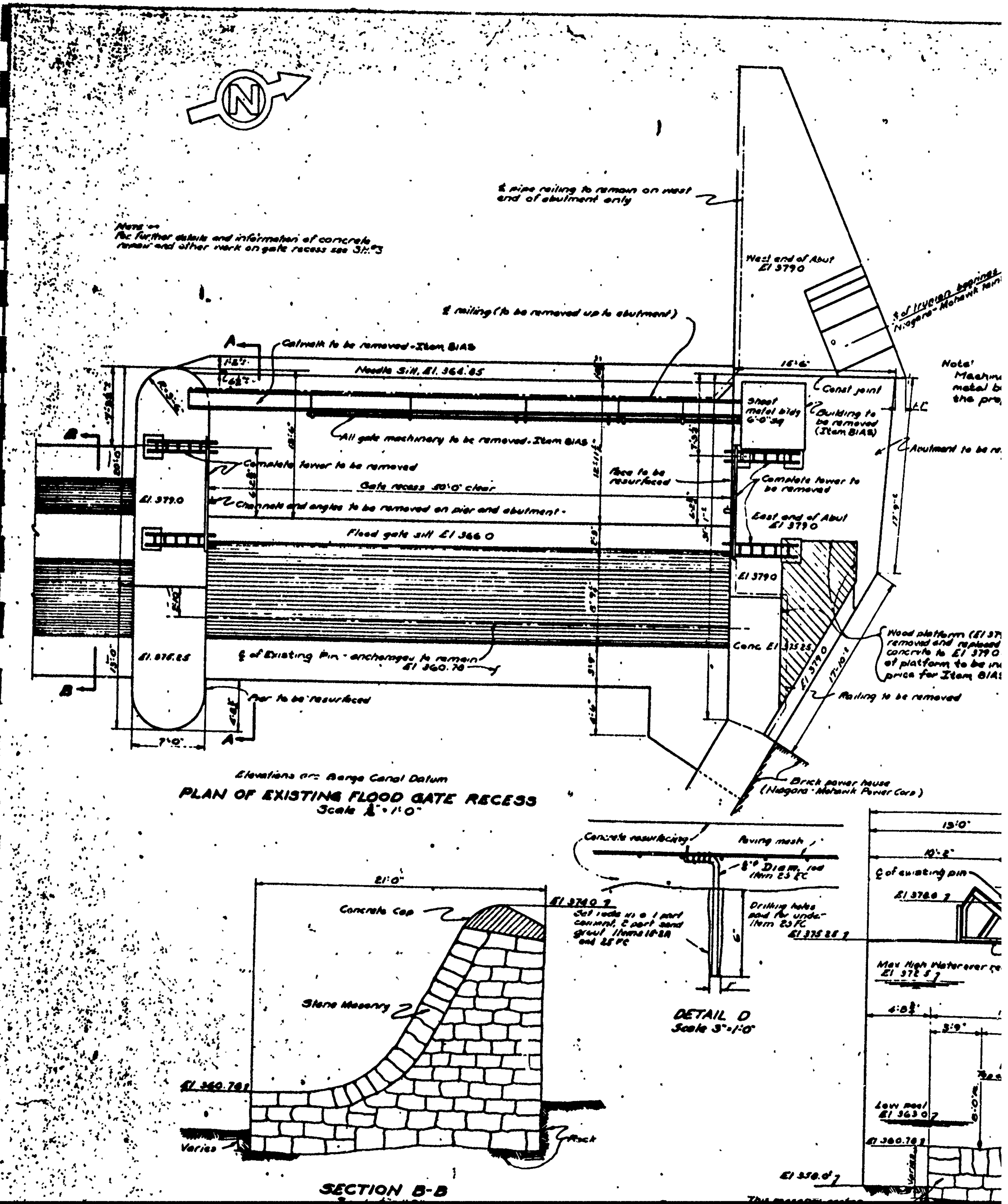
SCALES AS INDICATED
SHEETS 1 TO 5

The provisions of the Public Works Specifications of January 2, 1962 shall apply to this contract.

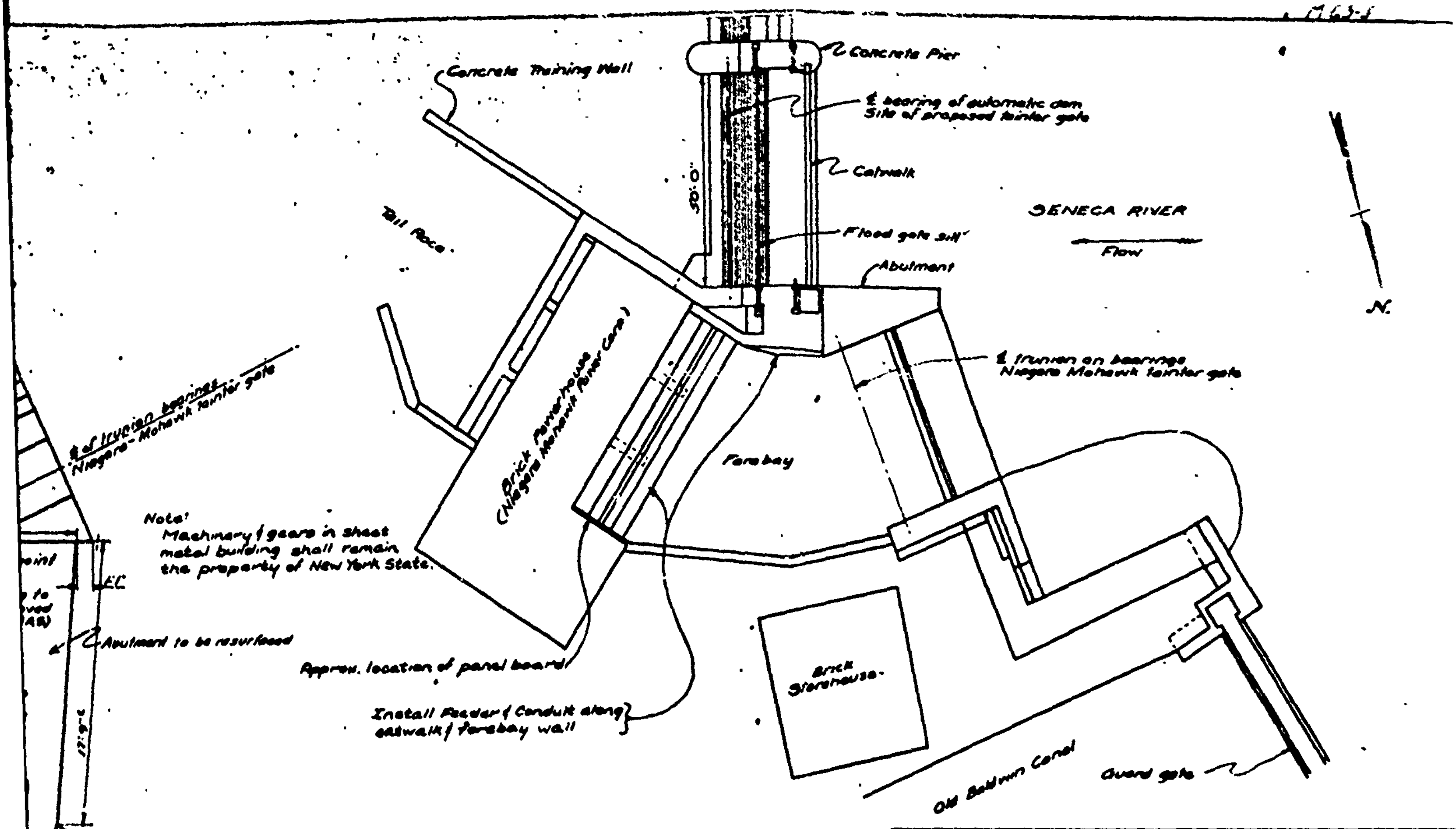
Approved Sept 6 1963
M.A. Bebee
M.A. BEBEE
Deputy Chief Engineer

Approved August 30, 1963
C.W. Hathaway
C.W. HATHAWAY
Asst. Deputy Chief Engineer (Design)

2



N
℄ pipe railing to remain on west end of abutment only
Note — For further details and information of concrete repair and other work on gate recess see Sh. 3
West end of Abut El 379.0
℄ railing (to be removed up to abutment)
Catwalk to be removed - Item 81AS
Needle Sill, El. 364.85
15'-6"
Const joint
Sheet metal bldg 6'-0" sq
Building to be removed (Item 81AS)
All gate machinery to be removed - Item 81AS
Complete tower to be removed
Gate recess 50'-0" clear
Face to be resurfaced
Complete tower to be removed
Abutment to be re
El. 379.0
Channels and angles to be removed on pier and abutment -
East end of Abut El 379.0
Flood gate sill El 366.0
El 379.0
Conc El 375.25
El 379.0
℄ of Existing Pin - anchorages to remain El 360.78
El. 375.25
Pier to be resurfaced
Railing to be removed
Wood platform (El 37 removed and replaced concrete to El 379.0 of platform to be in price for Item 81A
Brick power house (Niagara - Mohawk Power Corp.)
Note: Machine metal b the pro
7'-0"
A
B
Elevations are Barge Canal Datum
PLAN OF EXISTING FLOOD GATE RECESS
Scale 1/8" = 1'-0"
Concrete resurfacing
Paving mesh
5/8" Diam. rod Item 25 FC
Drilling holes paid for under Item 25 FC
El 375.25
21'-0"
Concrete Cap
El 379.0
Set rods in a 1 part cement, 2 part sand grout Items 18-SA and 25 FC
Stone Masonry
DETAIL D
Scale 3" = 1'-0"
El 360.78
Varies
Rock
SECTION B-B
El 358.0
13'-0"
10'-2"
℄ of existing pin
El 376.6
Max High Water
El 372.5
4'-8 1/2"
3'-9"
Low pool El 363.0
El 360.78
Varies



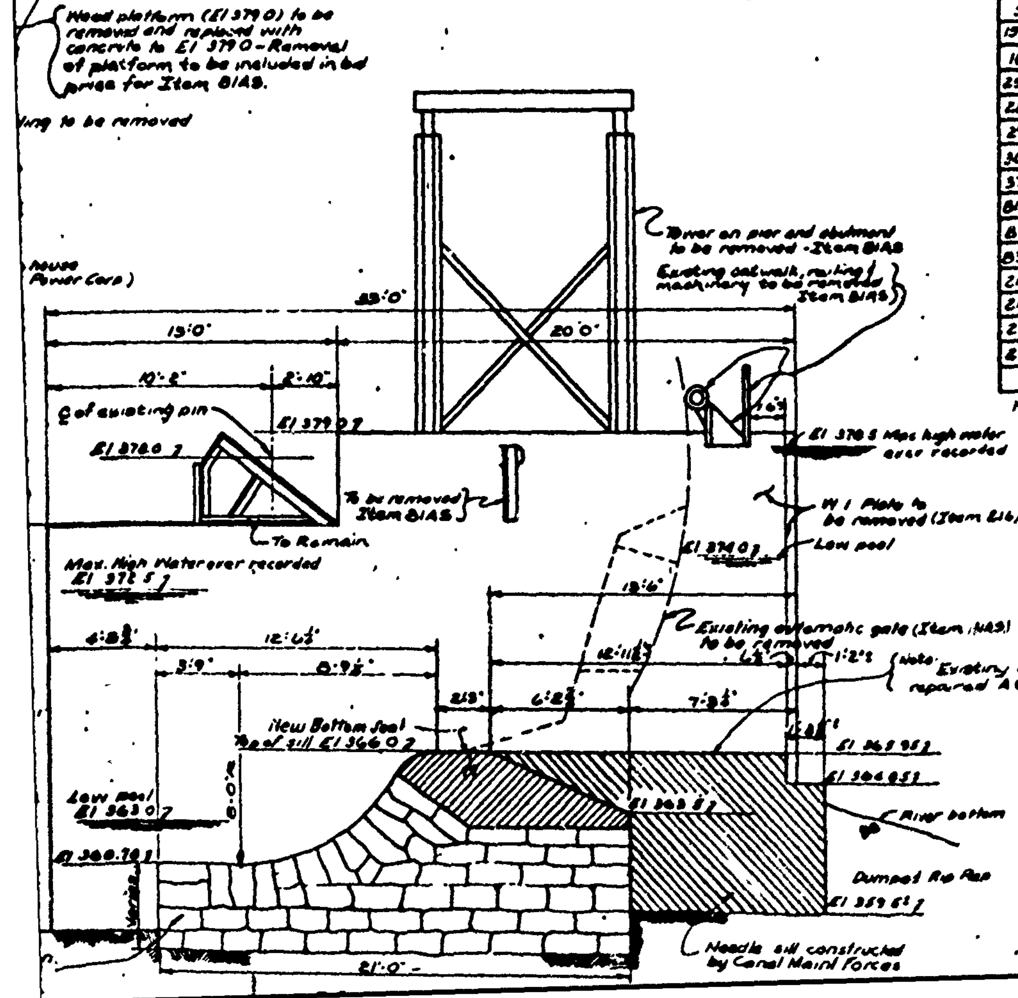
LOCATION PLAN
Scale 1" = 20'-0"

ESTIMATE OF QUANTITIES				
Item No	Description	Unit	Quantities Prop.	
5	Trench, Culvert, & Bridge Excavation	CY	5	
15-2A	Portland Cement - Type 2A	Bbl	140	
18	Class A Concrete For Structures	CY	80	
25FC	Steel Fabric Reinforcement	SY	80	
28C	Bar Reinforcement For Structures	Lb	1260	
29S	Structural Steel	Lb	39,500	
308C	Open Steel Floor	SF	140	
37C	Metal Railing	LF	140	
81AS	Removing Existing Structure	LS	Nec	
82X	Cofferdams	LS	Nec	
83S	Steel Sheet Piling	SF	245	
215	Furnishing & Applying Two Coats Epoxy Coal Tar Paint	Gal	55	
216	Removing Existing Concrete	CF	1370	
217	Repairing Gate Sill Concrete	CY	3	
218	Hoisting Equipment & Electrical Connections	LS	Nec.	

Note

The Contractor shall note, that due to the nature of the work involved, the actual quantities for some items may be considerably higher or lower than those shown in the Estimate of Quantities

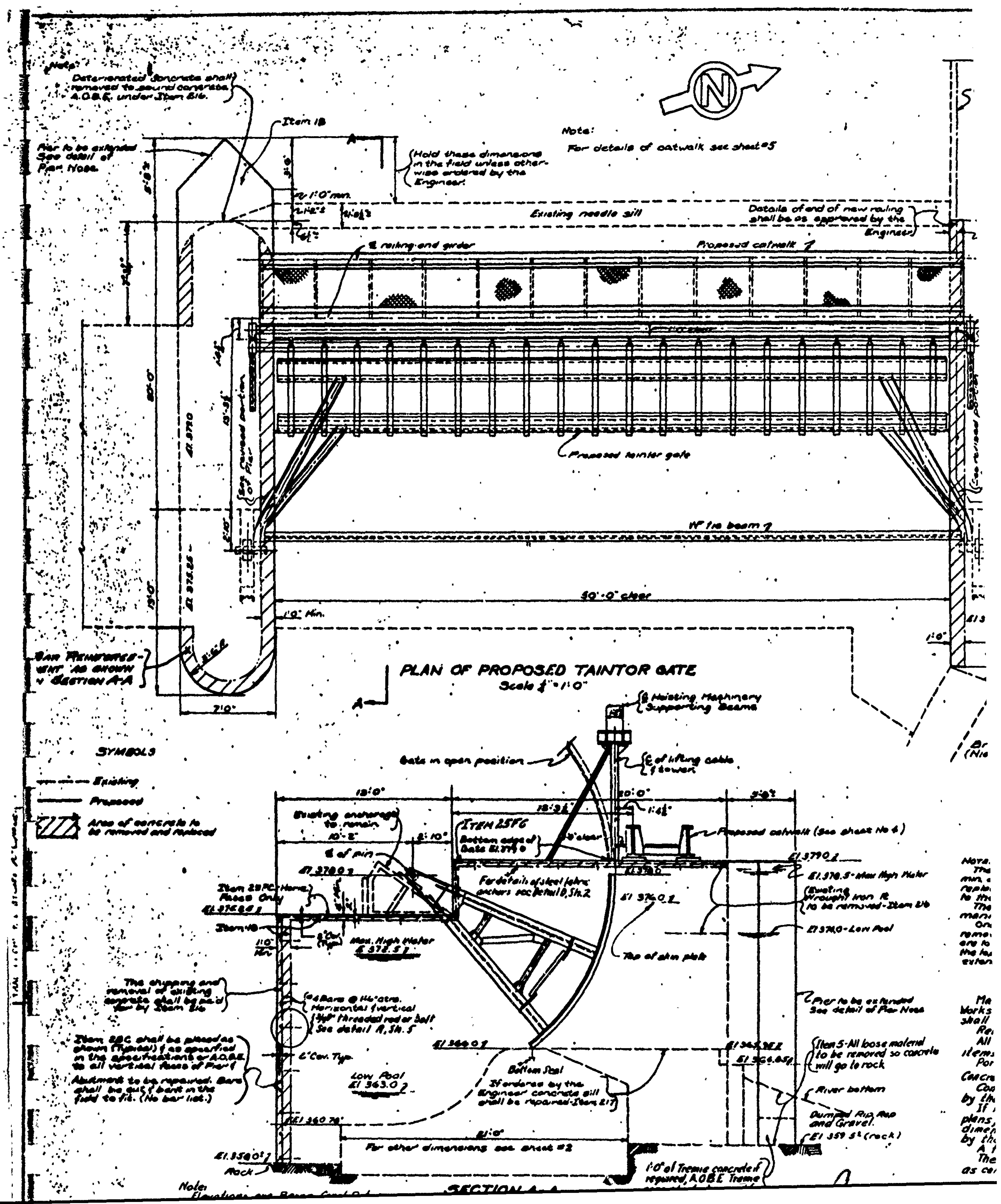
Item 217 of this contract is a contingent item, which may or may not be used depending upon whether the concrete gate sill is in need of repairs, which will be determined by the Engineer upon inspection in the field



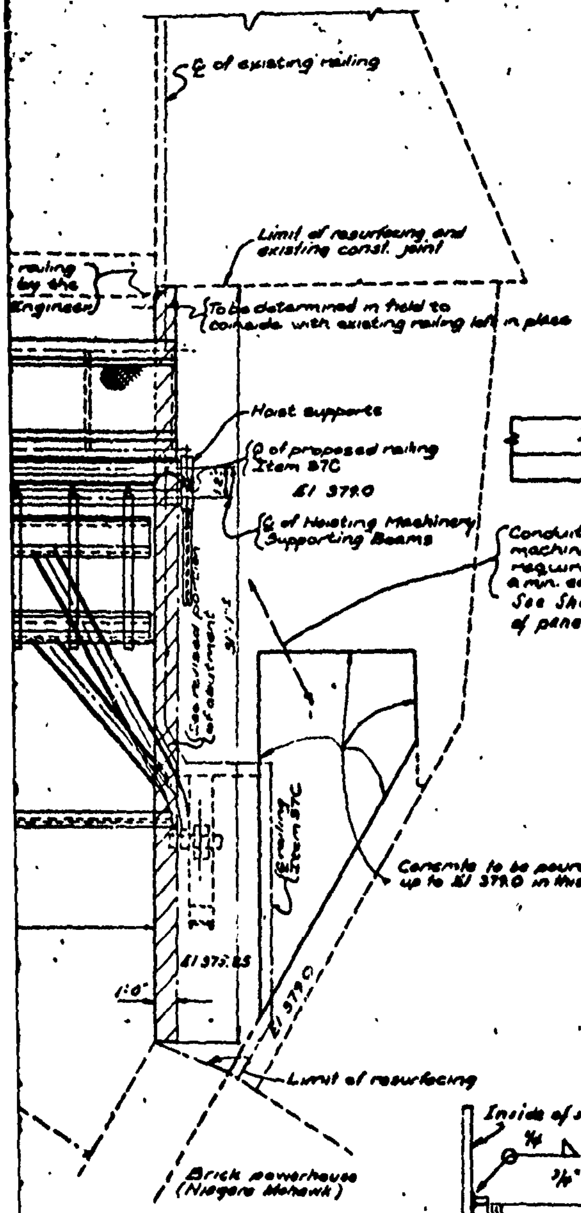
STATE OF NEW YORK
DEPARTMENT OF PUBLIC WORKS
DIVISION OF CONSTRUCTION

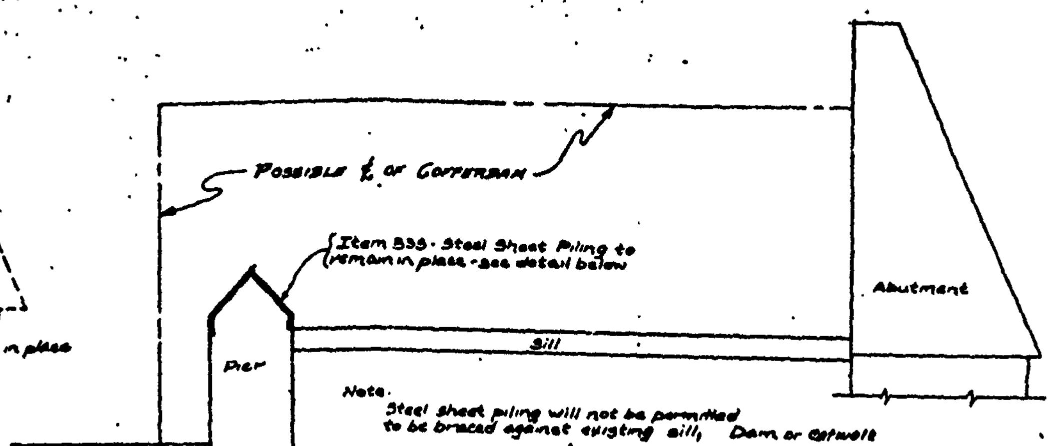
CONTRACT M 63-5

BALDWINSVILLE TAINTOR GATE

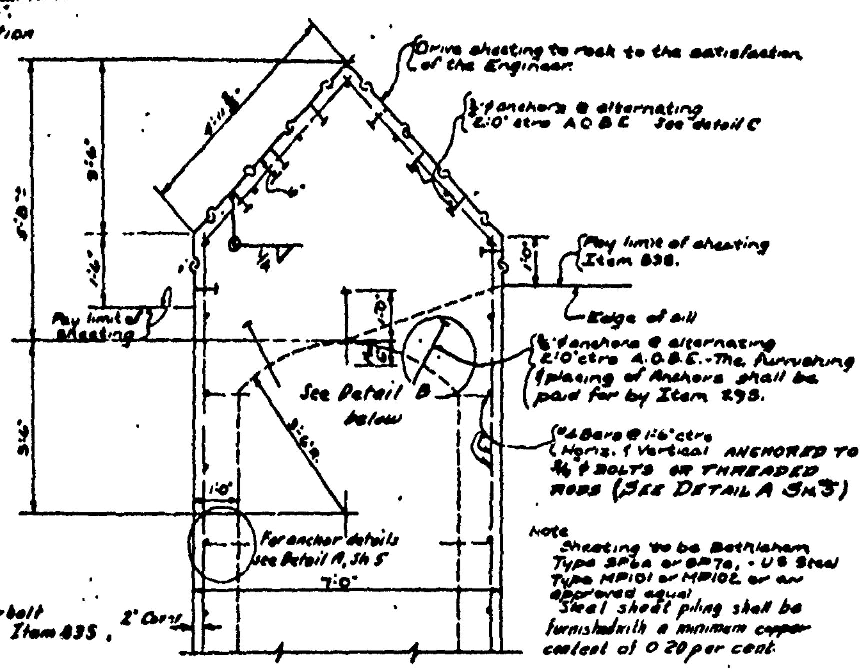


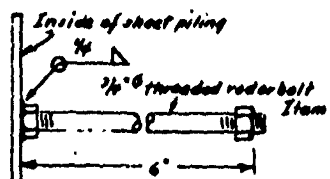
Note:
Deteriorated concrete shall removed to sound concrete A.O.B.E. under Item 816.
Item 18
Pier to be extended See detail of Pier Nose.
Note:
For details of catwalk see sheet #5
Hold these dimensions in the field unless otherwise ordered by the Engineer.
Existing needle sill
Details of end of new railing shall be as approved by the Engineer.
℄ railing and girder
Proposed catwalk
Proposed tainter gate
W 16 beam
50'-0" clear
1'-0" Min.
7'-0"
PLAN OF PROPOSED TAINTOR GATE
Scale ¼" = 1'-0"
SYMBOLS
Existing
Proposed
Area of concrete to be removed and replaced
℄ Hoisting Machinery Supporting Beams
Gate in open position
℄ of lifting cable & towers
13'-0"
20'-0"
Existing anchorage to remain
10'-2"
ITEM 25FC
Bottom edge of Gate El. 379.0
Proposed catwalk (See sheet No 4)
℄ of pin
El 378.0
For details of steel fabric anchors see Detail D, Sh. 2
El 379.0
El 376.5 - Max High Water
Existing Wrought Iron R to be removed - Item 816
El 374.0
El 374.0 - Low Pool
Top of skin plate
Item 25FC - Home Faces Only
Item 18
Max. High Water El 378.5
The chipping and removal of existing concrete shall be paid for by Item 816
#4 Bars @ 16" ctrs. Horizontal & vertical
3/4" threaded rod or bolt See detail A, Sh. 5
Item 28C shall be placed as shown (Typical) & as specified in the specifications or A.O.B.E. to all vertical faces of Pier 1
6" Cov. Typ.
Abutment to be repaired. Bars shall be cut & bent in the field to fit. (No bar list.)
Low Pool El 363.0
Bottom Seal
If ordered by the Engineer concrete sill shall be repaired - Item 817
Pier to be extended See detail of Pier Nose
Item 5 - All loose material to be removed so concrete will go to rock
River bottom
Dumped Rip Rap and Gravel.
El 359.5 (rock)
21'-0"
For other dimensions see sheet #2
El 356.0
Rock
1'-0" of Tremie concrete if required, A.O.B.E. Tremie
Note:
SECTION A-A





PLAN OF PILING & COFFERDAMS
Scale 1/8" = 1'0"





DETAIL C
Scale 3" = 1'0"

DETAIL OF PIER NOSE
Scale 1/4" = 1'0"

Notes:-

The entire horizontal surface of the pier is to be resurfaced. Four (4) inches min. or to sound concrete (A.O.B.E.) of existing concrete is to be removed and replaced with concrete including steel fabric reinforcement (Item 25FG) up to the elevations shown on the plans.

The horizontal surface of the abutment is to be resurfaced in the same manner as the pier within the limits shown.

One (1) foot min or to sound concrete (A.O.B.E.) of existing concrete is to be removed from the vertical surfaces of the pier and abutment. These areas are to be replaced with new concrete from the top of the pier and abutment to the top of the existing sill. In the areas beyond the sill the new concrete shall extend down to rock.

GENERAL NOTES

Material and Construction Specifications of N.Y.S. Department of Public Works dated January 2, 1962 with current additions and modifications shall be used.

Reinforcing Bars shall be lapped a minimum of 20 diameters.

All joint material if used, A.O.B.E., will be paid for under the various items of the contract.

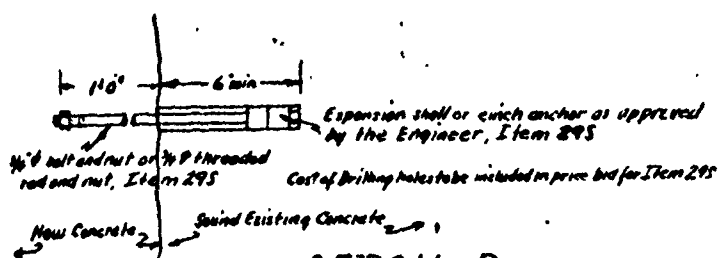
Portland Cement, Type 2A, Item 15-2A shall be used in Item 18-Class A Concrete for Structures.

Concrete surfaces exposed to view shall be rubbed if ordered by the Engineer.

If field conditions and dimensions differ from those shown on the plans, the Contractor shall work from actual field conditions and dimensions to satisfactorily perform the required work, as approved by the Engineer.

A field Engineer's Office is not required for this contract.

The support for the hoisting machinery shall be checked for stability, as called for by Item 218, by the supplier of the machinery.

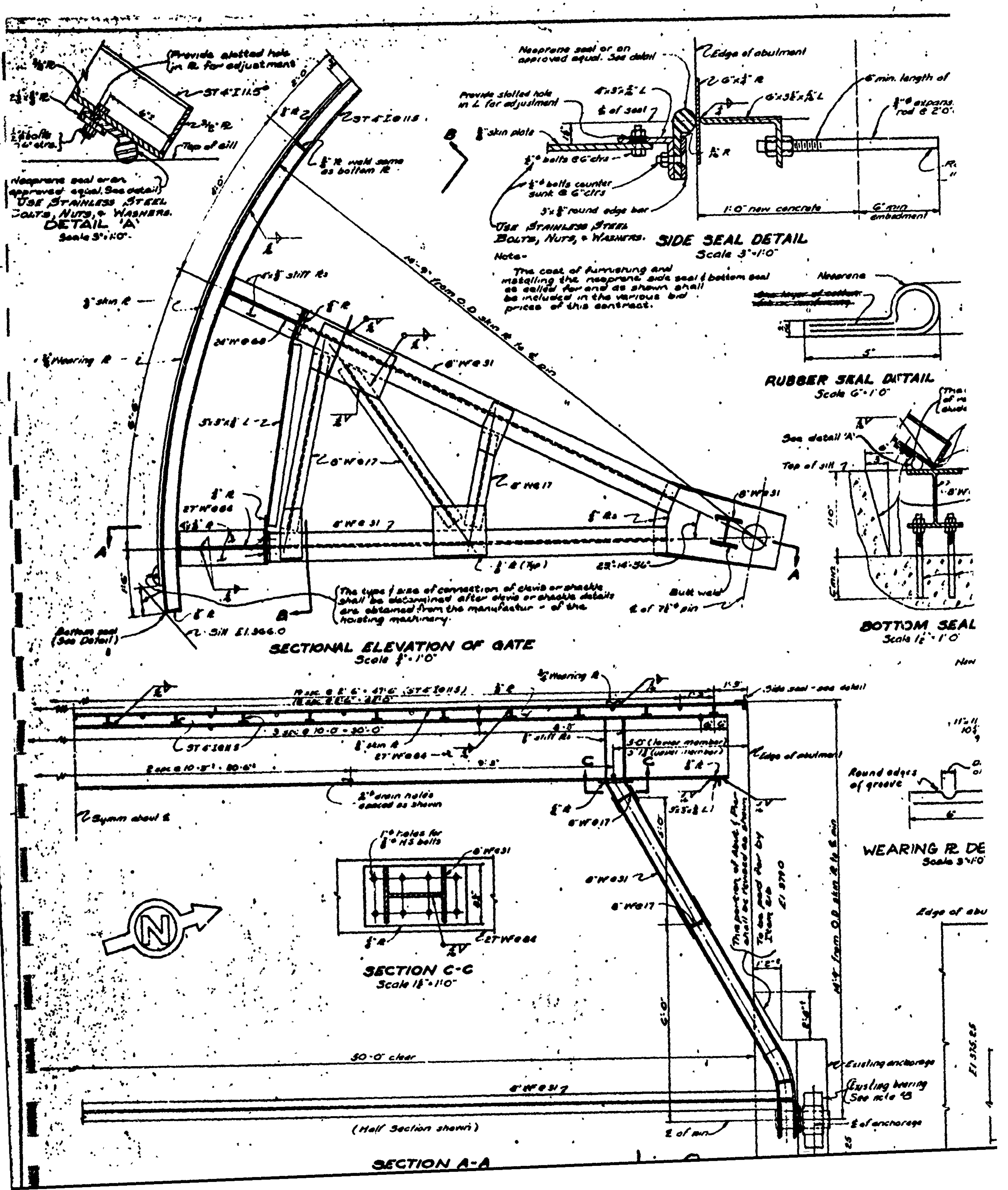


DETAIL B
Scale 1 1/2" = 1'0"

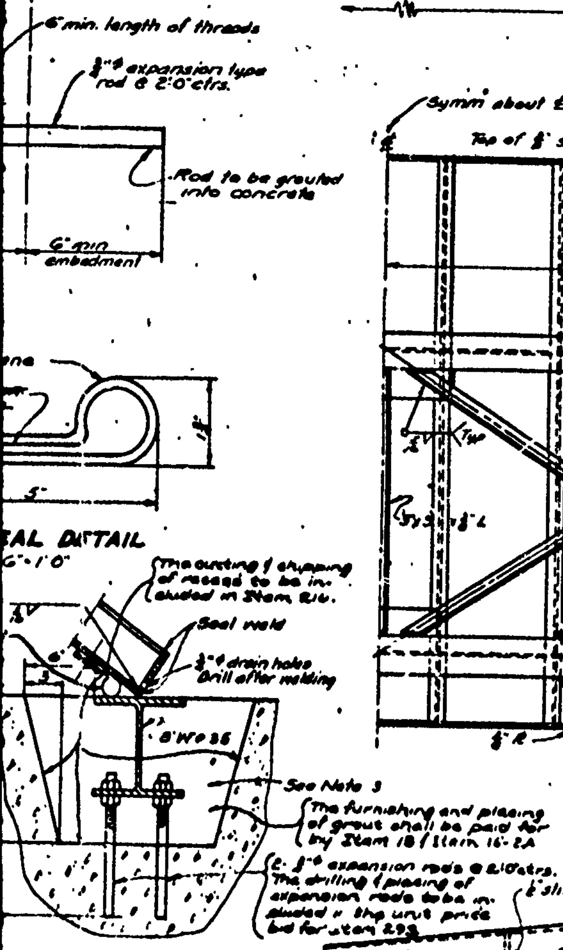
STATE OF NEW YORK
DEPARTMENT OF PUBLIC WORKS
DIVISION OF CONSTRUCTION

CONTRACT M 63-5

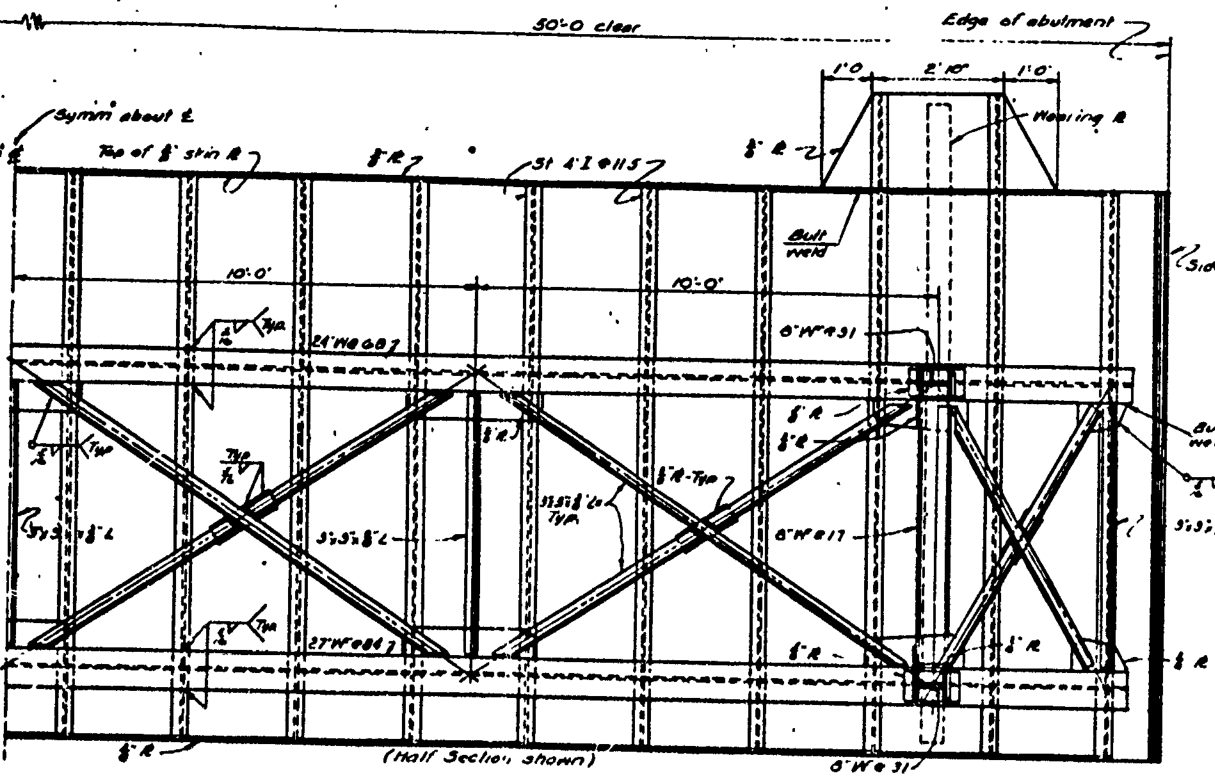
BALDWINSVILLE TAINTOR GATE



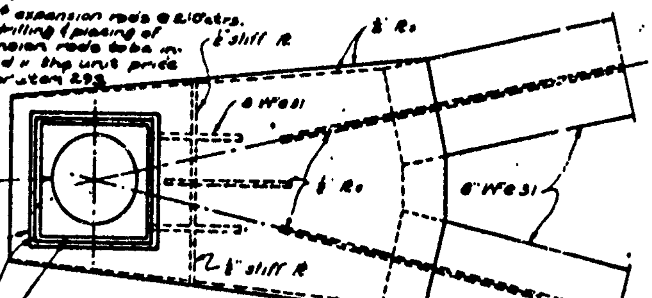
Provide slotted hole in R for adjustment
ST 4" I 11.5
Top of sill
Neoprene seal or an approved equal. See detail
USE STAINLESS STEEL BOLTS, NUTS, & WASHERS.
DETAIL 'A'
Scale 3"=1'0"
Neoprene seal or an approved equal. See detail
Edge of abutment
Provide slotted hole in L for adjustment
℄ of seal
skin plate
5" x 3/8" round edge bar
USE STAINLESS STEEL BOLTS, NUTS, & WASHERS.
1'0" new concrete
6" min. embedment
6" min. length of
SIDE SEAL DETAIL
Scale 3"=1'0"
Note-
The cost of furnishing and installing the neoprene side seal & bottom seal as called for and as shown shall be included in the various bid prices of this contract.
Neoprene
RUBBER SEAL DETAIL
Scale 6"=1'0"
See detail 'A'
Top of sill
BOTTOM SEAL
24"WF68
6"WF31
6"WF17
8"WF17
27"WF84
Wearing R
skin R
Sill El.366.0
Bottom seal (See Detail)
Butt weld
℄ of 7 1/2" pin
The type & size of connection of clevis or shackle shall be determined after clevis or shackle details are obtained from the manufacturer of the hoisting machinery.
SECTIONAL ELEVATION OF GATE
Scale 3/8"=1'0"
Side seal - see detail
ST 6" I 11.5
Edge of abutment
drain holes spaced as shown
Symm about ℄
Round edges of groove
WEARING R DE
Edge of abu
SECTION C-C
Scale 1 1/2"=1'0"
50-0" clear
Existing anchorage
Existing bearing See note 3
℄ of anchorage
(Half Section shown)
SECTION A-A



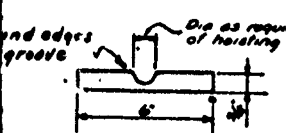
BOTTOM SEAL
Scale 1 1/2" = 1'-0"



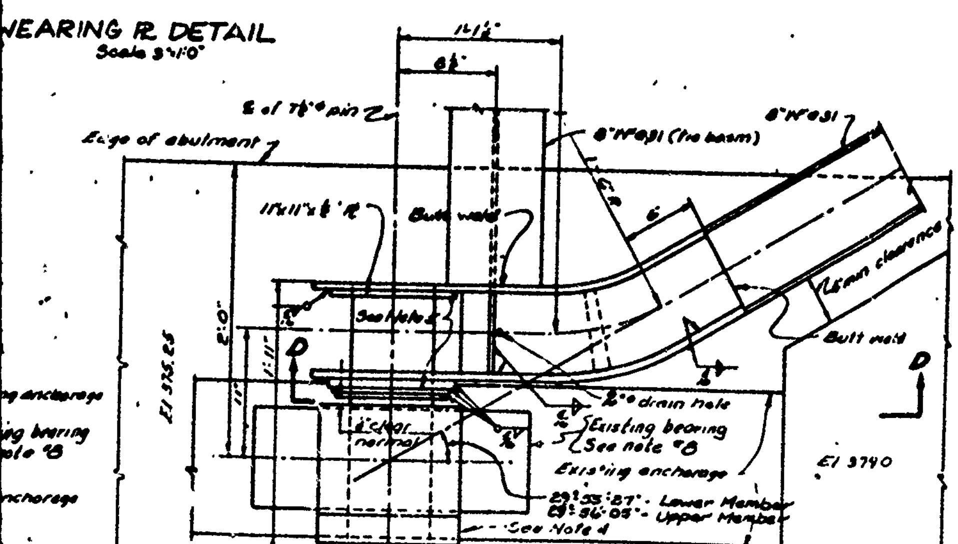
SECTION B-B DEVELOPED
Scale 1/4" = 1'-0"



SECTION D-D
Scale 1 1/2" = 1'-0"



NEARING ℞ DETAIL
Scale 3"=1'0"



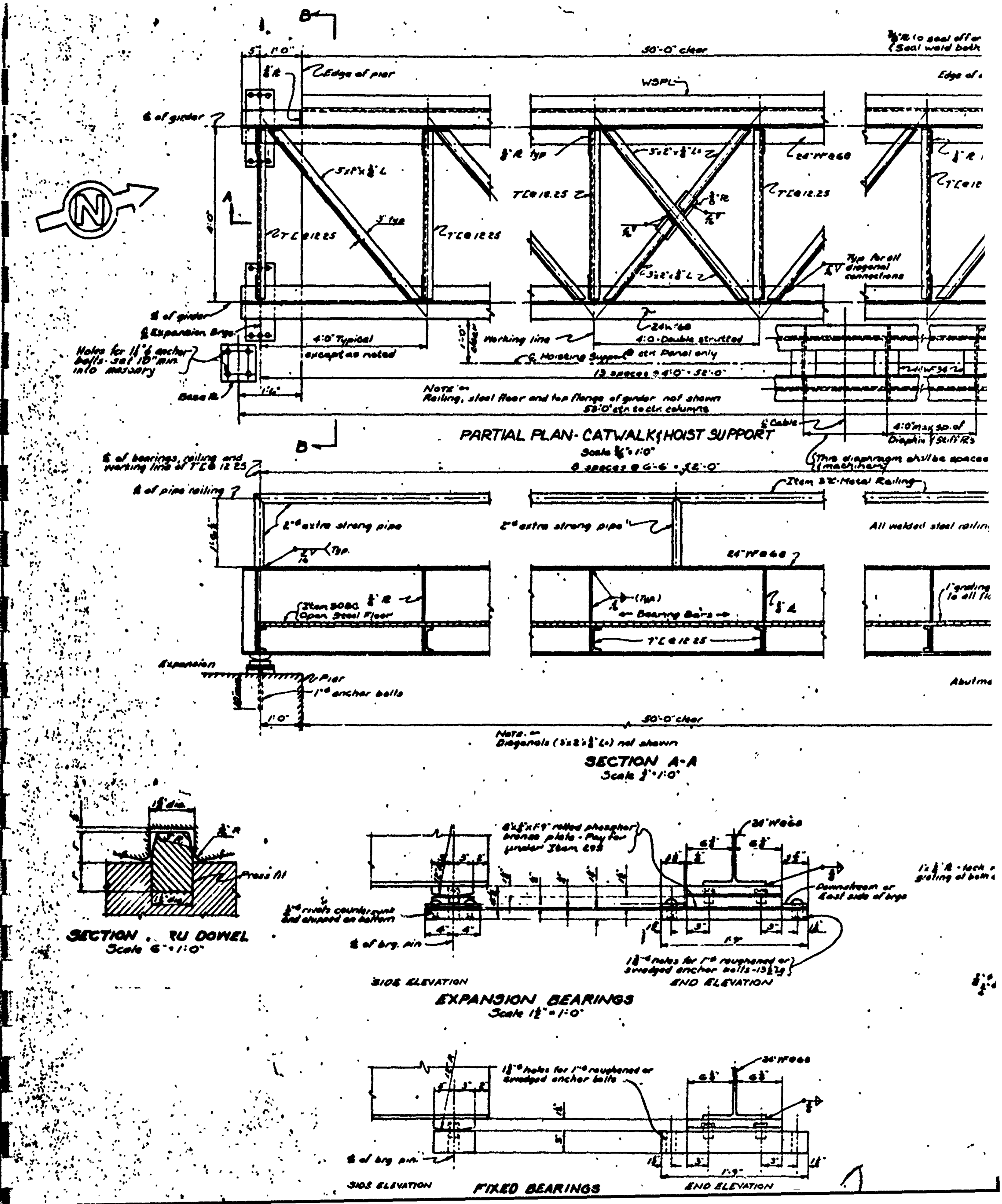
~ NOTES ~

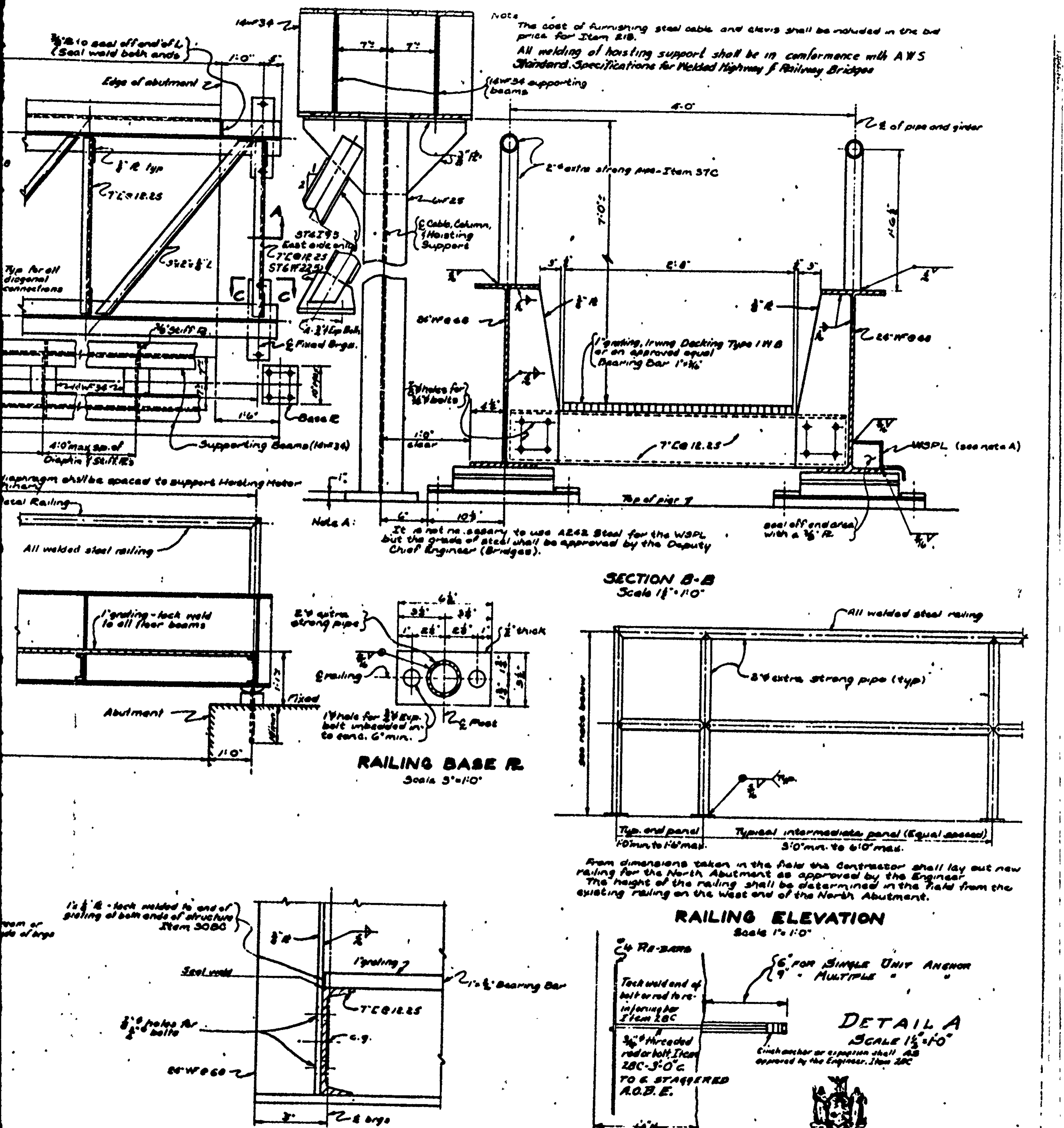
1. Unless otherwise stated all structural steel shall be A242 with corrosion resistance equal to 4 to 6 times that of A7 structural steel and be of weldable quality
2. Welding shall be performed with Class E 70XX low hydrogen electrodes
3. The recess on the bottom seal is to be filled with grout after the gate is in place and adjustment made to the seal to give the best possible fit with the gate
4. The existing bearing collar is to be utilized if collar is not worn If collar is worn it shall be replaced and paid for by Item 295.
5. Plates to be groove welded to pin Shop drawings to show procedure
6. All details shown are for the Abutment. Details pertaining to Pier are similar but opposite.
7. The existing anchorage shall be carefully inspected to insure that the steel is structurally sound. Any necessary repairs on the existing anchorage shall be A.O.B.E. and paid for under Item 295.
8. If babbitts of existing bearings are worn, as determined by the Engineer, they shall be replaced with new babbitts Babbitt metal used, if babbitts are to be replaced, shall be paid for by the unit price bid for Item 295 All other cost shall be included in the various bid prices of the Contract.
9. STAINLESS STEEL BOLTS SHALL MEET THE REQUIREMENTS OF ASTM SPECIFICATION A320-58T AND NUTS & WASHERS - A.S.T.M. SPEC. A194-58T.

STATE OF NEW YORK
DEPARTMENT OF PUBLIC WORKS
DIVISION OF CONSTRUCTION

CONTRACT M 63-5

BALDWINSVILLE TAINTOR GATE

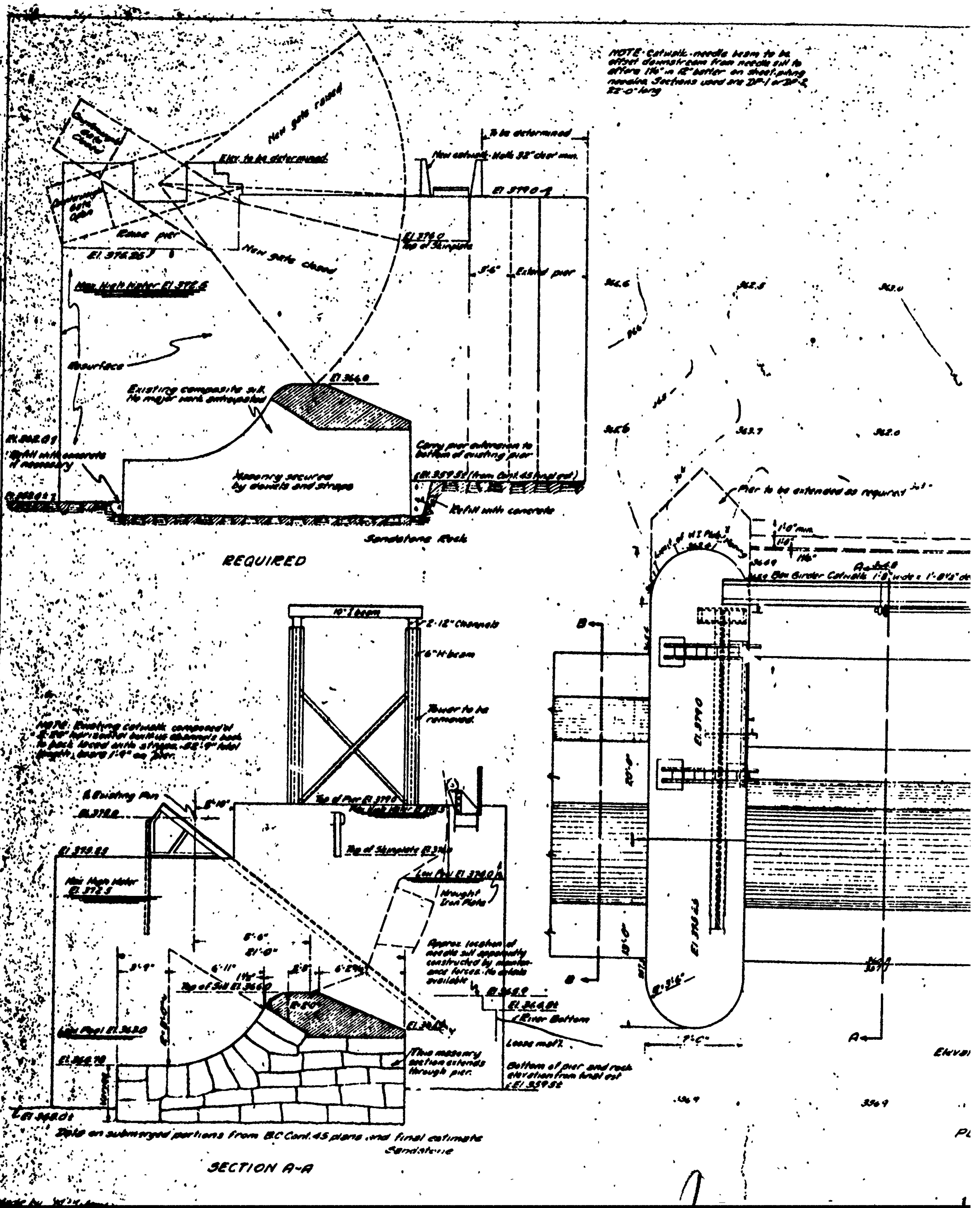

PARTIAL PLAN - CATWALK & HOIST SUPPORT
Scale 3/8" = 1'-0"
50'-0" clear
Edge of pier
WSPL
℄ of girder
3/8" R typ
5x3½x3/8" L
T℄ @ 12.25
24" WF 68
3" typ
Typ for all diagonal connections
℄ Expansion Brgs.
Holes for 1¼" φ anchor bolts - set 10" min. into masonry
Base R
4'-0" Typical except as noted
Working line
4'-0" Double strutted
℄ Hoisting Support @ ctr. Panel only
13 spaces @ 4'-0" = 52'-0"
Note:-
Railing, steel floor and top flange of girder not shown
53'-0" ctr. to ctr. columns
℄ Cable
4'-0" max sp. of Diaphr. & Stiff. R's
This diaphragm shall be spaced (machinery)
℄ of bearings, railing and working line of T℄ @ 12.25
8 spaces @ 6'-6" = 52'-0"
℄ of pipe railing
2" φ extra strong pipe
Item 57C - Metal Railing
All welded steel railing
24" WF 68
Item 508C Open Steel Floor
Bearing Bars
T℄ @ 12.25
Expansion
Pier
1" φ anchor bolts
Abutment
50'-0" clear
Note:-
Diagonals (3x2½x3/8" L's) not shown
SECTION A-A
Scale ½" = 1'-0"
SECTION THRU DOWEL
Scale 6" = 1'-0"
Press fit
8x1½x1'-9" rolled phosphor bronze plate - Pay for under Item 29B
24" WF 68
Downstream or East side of brgs.
1" φ rivets countersunk and chipped on bottom
℄ of brg. pin
1⅛" φ holes for 1" φ roughened or swedged anchor bolts - 1'-3½" lg.
SIDE ELEVATION
END ELEVATION
EXPANSION BEARINGS
Scale 1½" = 1'-0"
1⅛" φ holes for 1" φ roughened or swedged anchor bolts
℄ of brg. pin
SIDE ELEVATION
FIXED BEARINGS
END ELEVATION

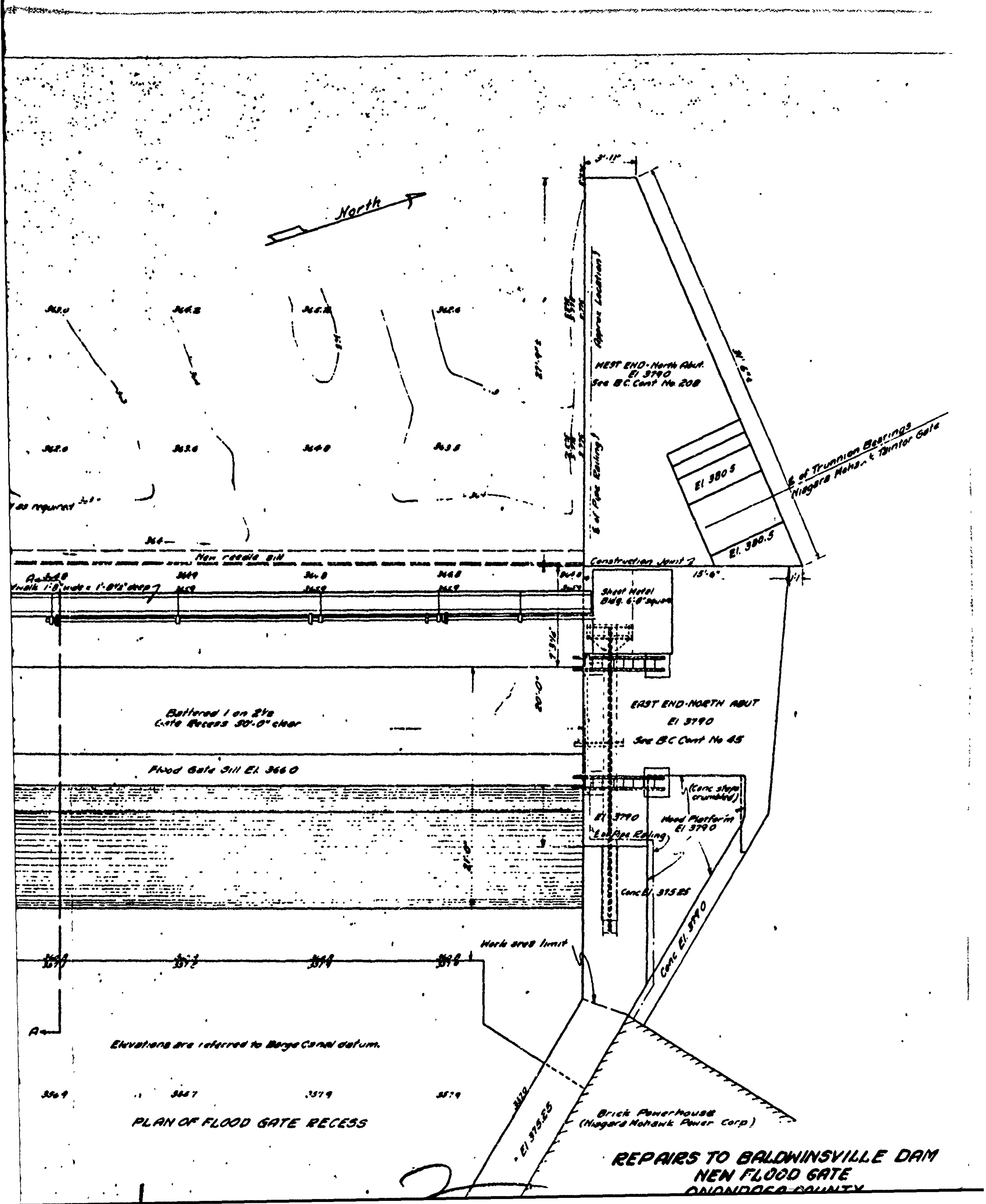


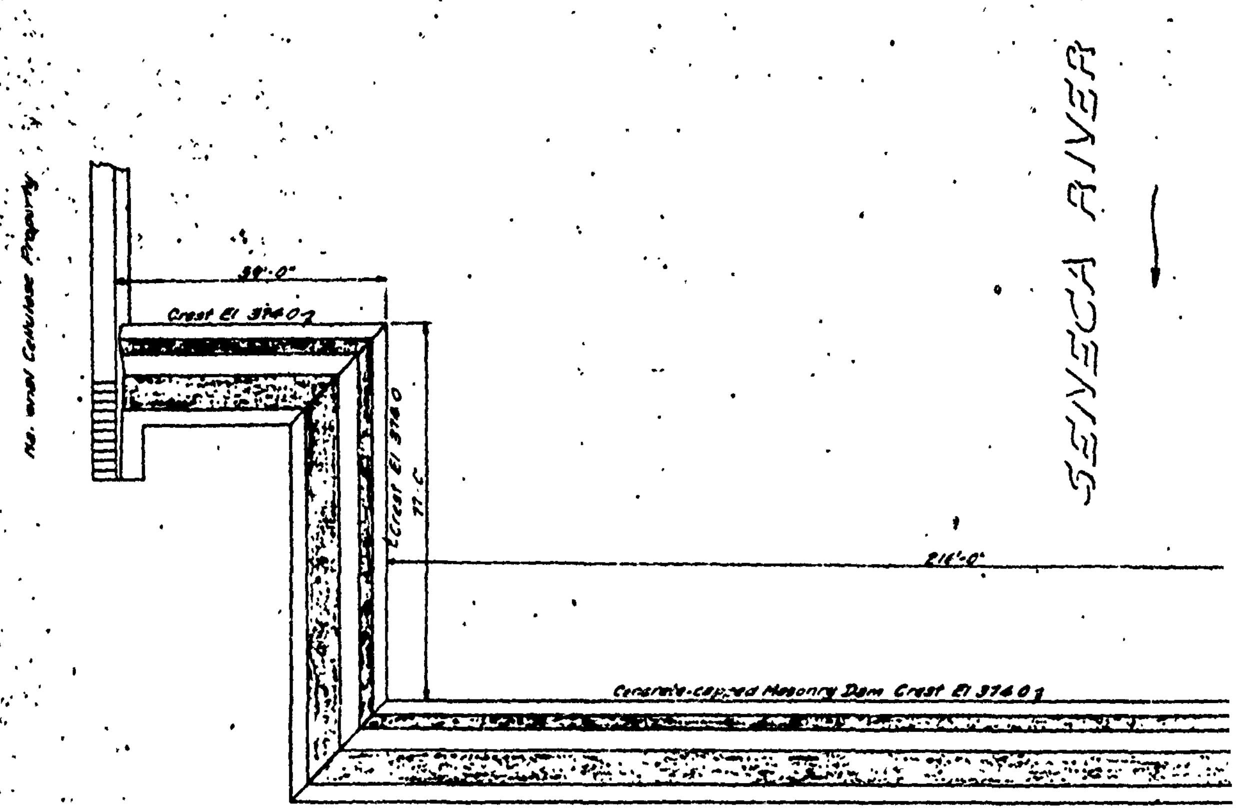
STATE OF NEW YORK
DEPARTMENT OF PUBLIC WORKS
DIVISION OF CONSTRUCTION

CONTRACT M 63-5

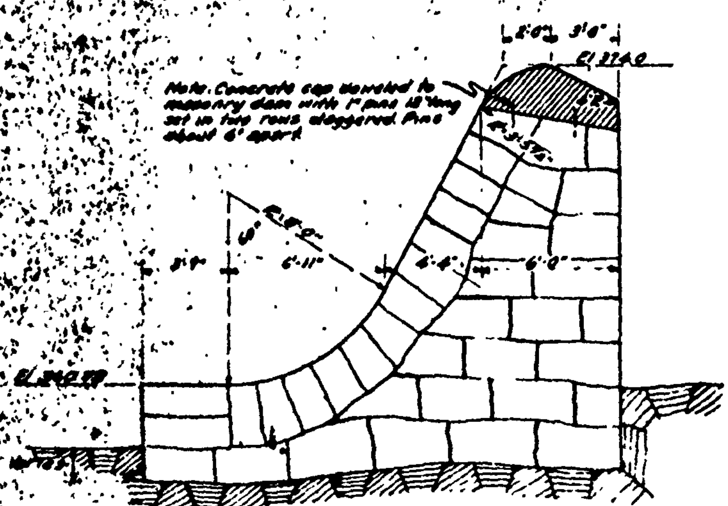
BALDWINSVILLE TAINTOR GATE


NOTE: Catwalk-needle beam to be offset downstream from needle sill to afford 1½" in 12" batter on sheet-piling needles. Sections used are DP-1 or DP-2, 22'-0" long
New gate raised
To be determined
New catwalk. Walls 32" clear min.
Elev. to be determined
El. 379.0
Raise pier
El. 376.0
Top of Skinplate
New gate closed
El. 376.25
5'-6"
Extend pier
Max High Water El. 372.6
Resurface
El. 366.0
Existing composite sill. No major work anticipated
El. 362.0
Refill with concrete if necessary
Carry pier extension to bottom of existing pier
Masonry secured by dowels and straps
El. 359.52 (from Cont. 45 final est.)
Refill with concrete
Sandstone Rock
REQUIRED
Pier to be extended as required
Box Girder Catwalk
El. 379.0
El. 372.6
10" I beam
2-12" Channels
6" H-beam
Tower to be removed.
NOTE: Existing catwalk composed of 2-20" horizontal builtup channels back to back laced with straps, 22'-9" total length, bearing 1'-6" on pier.
Existing Pin
El. 379.0
Top of Pier El. 379.0
Max High Water El. 372.6
Top of Skinplate El. 376.0
Low Pool El. 376.0
Wrought Iron Plate
Max High Water El. 372.5
Approx. location of needle sill apparently constructed by maintenance forces. No details available
Top of Sill El. 366.0
El. 364.84
River Bottom
Loose mat'l.
Low Pool El. 363.0
This masonry section extends through pier.
Bottom of pier and rock elevation from final est. El. 359.52
El. 360.01
Data on submerged portions from B.C. Cont. 45 plans and final estimate
Sandstone
SECTION A-A
Elevation
Made by

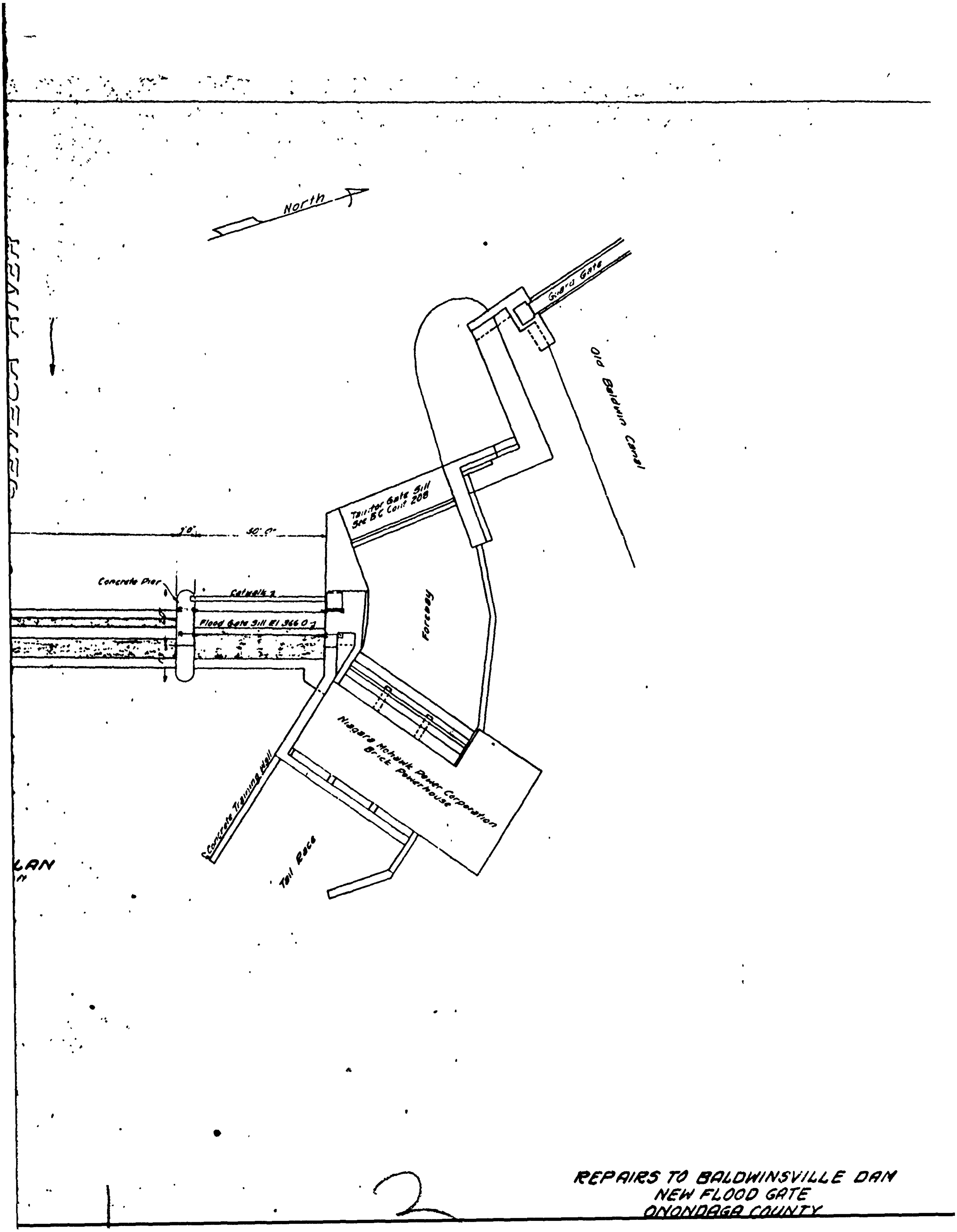

North
3'-11"
WEST END - North Abut.
El 379.0
See B.C. Cont. No. 208
Approx. Location
℄ of Pipe Railing
℄ of Trunnion Bearings
Niagara Mohawk Tainter Gate
El. 380.5
El. 380.5
Construction Joint
New needle sill
15'-6"
Sheet Metal
Bldg. 6'-8" square
Battered 1 on 2½
Gate Recess 30'-0" clear
20'-0"
EAST END - NORTH ABUT.
El 379.0
See B.C. Cont No 45
Flood Gate Sill El. 366.0
(Conc. steps crumbled)
El 379.0
Head Platform
El 379.0
℄ of Pipe Railing
Conc El. 375.25
Work area limit
Conc El. 379.0
Elevations are referred to Barge Canal datum.
Brick Powerhouse
(Niagara Mohawk Power Corp.)
El 375.25
PLAN OF FLOOD GATE RECESS
REPAIRS TO BALDWINSVILLE DAM
NEW FLOOD GATE
ONONDAGA COUNTY



LOCATION PLAN
Scale 1"=20 ft



SECTION B~B
Scale 1/4"=1'-0"



REPAIRS TO BALDWINSVILLE DAM
NEW FLOOD GATE
ONONDAGA COUNTY